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# FM 1-10

DEPARTMENT OF THE ARMY FIELD MANUAL

Supers. by FM 1-10 (20 Sep 65)

# ARMY AVIATION ORGANIZATIONAL AIRCRAFT MAINTENANCE AND SUPPLY

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HEADQUARTERS, DEPARTMENT OF THE ARMY

AUGUST 1960

AGO 758B

FIELD MANUAL

# ARMY AVIATION ORGANIZATIONAL AIRCRAFT MAINTENANCE AND SUPPLY

FM 1–10
CHANGES NO. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *16 April 1962*

FM 1–10, 17 August 1960, is changed as follows:

1. Change DD Form 781-series (–1 through –6) to read DA Form 2391-series (–1 through –6) in paragraphs 11.2, 11.4, and appendixes II and III.

2. Remove the pages indicated below from the basic manual and substitute the attached revised pages as follows:

| Remove pages | Insert pages |
|---|---|
| i, ii | i, ii |
| 2–1 through 2–6 | 2–1 through 2–5 |
| 4–1, 4–2 | 4–1, 4–2 |
| 5–5, 5–6 | 5–5, 5–6 |
| 8–1 through 8–12 | 8–1 through 8–10 |
| 9–1 through 9–4 | 9–1 through 9–4, and 9–4.1 |
| 9–17 through 9–20 | 9–17 through 9–19 |
| I–1, I–2 | I–1, I–2 |
| IV–1 through IV–6 | Rescinded |

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*NG:* State AG (3); units—same as Active Army except allowance is one copy to each unit.

*USAR:* Same as Active Army.

For explanation of abbreviations used, see AR 320–50.

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FIELD MANUAL
No. 1–10

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *17 August 1960*

# ARMY AVIATION ORGANIZATIONAL AIRCRAFT MAINTENANCE AND SUPPLY


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# PART ONE
# THE MAINTENANCE SYSTEM
# CHAPTER 1
# INTRODUCTION

## Section I. PURPOSE AND SCOPE

### 1–1. Purpose

*a.* This manual provides concepts, doctrine, and techniques on organizational aircraft maintenance and supply. The objective is to furnish guidelines for organizational maintenance and supply supervisors in management, supervision, and scheduling of aircraft maintenance, and for instructor use in service schools.

*b.* Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded direct to US Army Aviation School, Fort Rucker, Alabama.

### 1–2. Scope

*a.* This manual provides Army aircraft maintenance and supply supervisors with information to accomplish organizational aircraft maintenance management, supervision, programming, and scheduling requirements.

*b.* Unless otherwise specified, the material presented herein is applicable without modification to both nuclear and nonnuclear warfare.

## Section II. PRINCIPLES OF MAINTENANCE AND SUPPLY

### 1–3. Introduction to Organizational Aircraft Maintenance

*a.* Maintenance operations are classified into categories according to the frequency, magnitude, and degree of technical skill required (AR 750–5). Jobs are performed by using organizations and by technical service organizations in accordance with time

available within the organization and the availability of skilled personnel, tools, equipment, and supplies. The specific categories of maintenance are *organizational, field,* and *depot.*

*b.* Organizational maintenance is that maintenance authorized for, performed by, and the responsibility of, a using organization on its own equipment.

*c.* Organizational maintenance is primarily preventive maintenance and, as such, is a command responsibility. Adequate organizational maintenance produces a high percentage of aircraft availability and airworthiness. Inadequate organizational maintenance causes delay, may endanger the pilot, and may ground the aircraft for extensive field maintenance.

*d.* Organizational aircraft maintenance includes—

(1) Inspecting, cleaning, servicing, preserving, lubricating, and adjusting.

(2) Replacing parts not requiring a high degree of skill.

(3) Maintaining the approved stock level (prescribed load) of parts.

(4) Planning the requisition of aircraft repair parts so that these parts will be available to fulfill scheduled inspection requirements.

(5) Scheduling aircraft for planned downtime.

(6) Maintaining appropriate and accurate records.

## 1–4. General Maintenance Objectives

*a. Objective.* The objective of maintenance is to discover and correct potential mechanical failures before they occur. Frequent command and technical inspections will reveal to supervisors how closely maintenance personnel comply with technical instructions. Maintenance is dependent on supply which, in turn, is dependent on supply economy, proper requisitioning, and well-supervised scheduling. To achieve the maintenance objective, the following principles are applied:

(1) *Repairs.* Maintenance will be accomplished at the lowest level consistent with—

(*a*) The scope of work authorized;

(*b*) The availability of repair parts, tools, and special repair equipment;

(*c*) The capability of personnel;

(*d*) The time available; and

(*e*) The tactical situation.

(2) *Echelon.* No echelon of maintenance will neglect pre-

scribed duties to perform higher echelon maintenance. However, any echelon may perform that maintenance normally ascribed to a lower echelon.

(3) *Cannibalization.* Cannibalization is prohibited except in the following circumstances:

(*a*) It may be authorized in urgent situations in forward areas where immediate contact with the support unit is impossible.

(*b*) Chief of technical service may authorize cannibalization of a particular major item, such as one being phased out of the system (AR 750–50).

*Note.* This does not preclude the implementation of AR 750–1500–8 as discussed in paragraph 11–6*b*.

(4) *Evacuation.* Parts or assemblies removed from an aircraft must be evacuated immediately, as explained in paragraph 1–5*d*.

*b. Aircraft Maintenance.* Army aircraft maintenance and supply units within their area of responsibility and authorization maintain Army aircraft and equipment in a service-flyable condition. This maintenance, performed at various levels, is a command responsibility.

*c. Technical Supply.* The function of technical supply is timely issuance of replacement items necessary to maintain Army aircraft.

## 1–5. Return of Material

*a. Serviceable Equipment.* Uninterrupted supply support depends upon timely return of replacement components by the using unit. These components pass through supply channels to the appropriate commercial contractor, Army general depot, or overhaul facility. Forecasts of reparable returns from using units provide basic planning data for the stock control point in establishing workload requirements at contractor and Army depot repair facilities. Reparables not available at the overhaul facility can disrupt schedules and require revision of plans by Headquarters, Department of the Army. For details on the three categories of reparable secondary Transportation items, see TB AVN 23–7.

*b. Unserviceable Equipment.* Aircraft equipment which cannot be repaired by the using organization is removed from the aircraft, tagged with a Reparable or Rework Tag, AF Form 50D (fig. 1–1) as appropriate, and turned in for repair and recovery by higher echelons. The habitual practice of keeping repair parts in supply channels will make them available when needed.

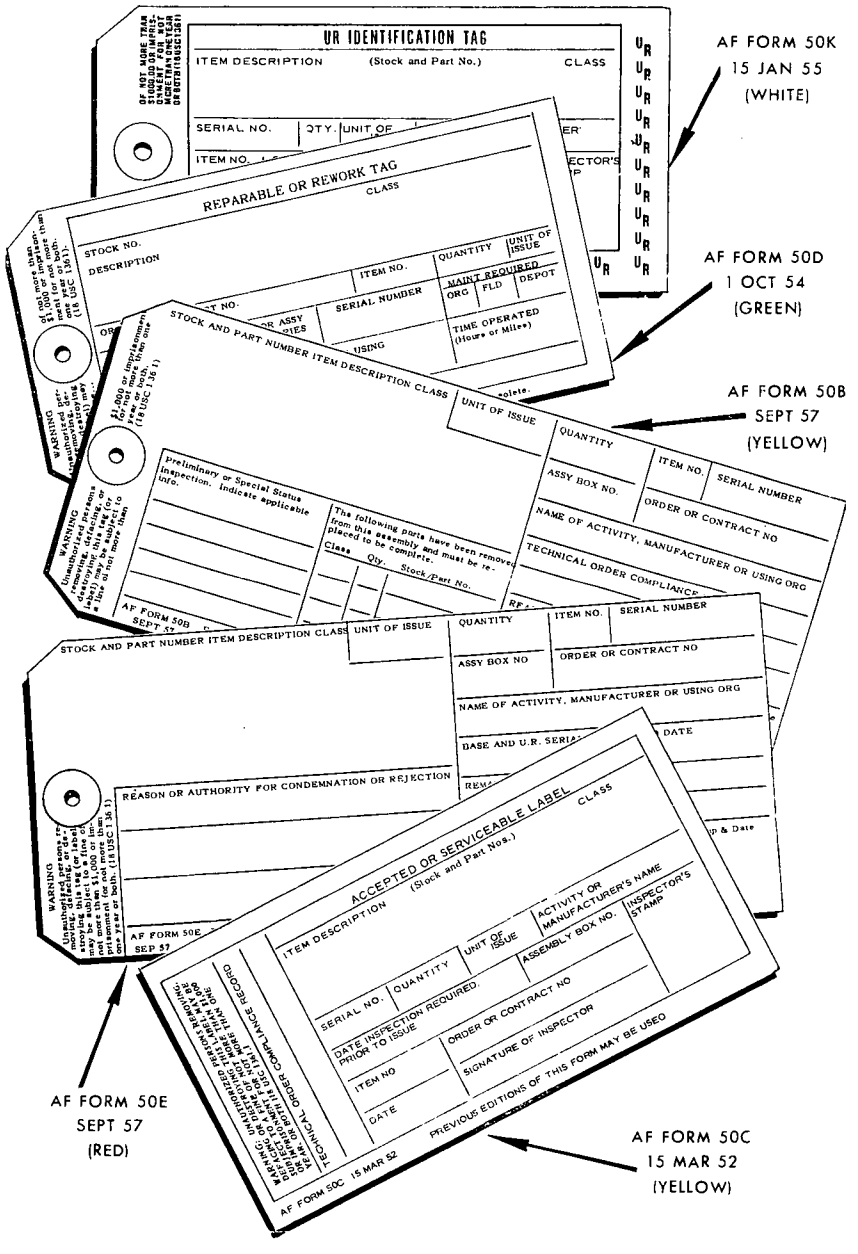



*Figure 1–1. AF form 50 series, parts tags.*

*c. Prompt Turn-in.* Organizational maintenance units will operate within basic stock allowances and expedite the prompt turn-in of all reparable and unserviceable equipment.

*d. Prompt Evacuation to Higher Maintenance Units.* Repair

beyond the scope of organizational maintenance will be evacuated to the next higher maintenance activity. Unserviceable organizational repair parts, other than those having no reclaimable value, are replaced by direct exchange.

# CHAPTER 2
# CATEGORIES OF MAINTENANCE AND SUPPLY

## 2–1. General

The three categories of maintenance (par. 1–3*a*) are divided into five echelons, increasing in complexity from lowest to highest. Maintenance units in any category or echelon may perform any type maintenance provided time, personnel, parts, equipment, and authority permit.

## 2–2. Purpose of Higher Categories

Each echelon is assigned certain duties and supplied with repair parts, tools, special equipment, and trained personnel to perform maintenance within its authorized responsibility. The higher categories provide maintenance beyond the capabilities of a lower category, and aircraft requiring such maintenance will be properly evacuated to the next higher echelon. In the interest of safety, this evacuation should not be delayed to correct minor organizational repairs. Transportation Corps maintenance units salvage, reclaim, and evacuate major items, assemblies, subassemblies, and parts to the maximum to reduce the demand on general supply channels for new supplies.

## 2–3. Organizational Category Requirements

Each category of maintenance requires special tools and equipment for each type aircraft. As the category progresses upward, equipment and tools become more complex.

*a. Special Tools and Equipment.* Organizational aircraft maintenance (first and second echelon) requirements for special tools and equipment are directly related to the type and number of aircraft maintained by the unit. Authority for the special tools and equipment is found in TM 55–( )–( )–20 (referred to as the "dash 20" series) for each type aircraft and/or engine.

*b. Repair Parts.* Army aviation organizational maintenance units carry a prescribed load of repair parts as outlined in TM –20P for each type aircraft supported.

*c. Personnel.* Aircraft units require trained personnel to perform first and second echelon maintenance. As the categories

advance in technical complexity, the need for specialists in the various aircraft components increases.

*d. Authority.* Categories of organizational maintenance are outlined in AR 750–5; Maintenance Allocation Charts specify the scope of work for which each echelon is responsible.

*e. Reports.* The number of recurring reports on the aircraft increases with the degree and amount of maintenance. Organizational aircraft maintenance includes a proportional volume of these reports.

## 2–4. Organizational Aircraft Maintenance

*a. General.* Organizational aircraft maintenance includes the proper care, use, operation, preservation, lubrication, adjustment, minor repairs, testing, and parts replacement as prescribed by Maintenance Allocation Charts and Tool and Parts Lists. This category of maintenance uses specially trained personnel and the necessary tools, parts, supplies, and test equipment to perform its mission. An inspection program for preventive Army aircraft maintenance (AR's 750–1, 750–5, 750–8, 750–725) has been provided to minimize accidents and reduce the number of uncompleted missions. Such inspections are the responsibility of organizational aircraft maintenance installations and are included in the scheduling of this maintenance category. Important inspections are *daily, intermediate, periodic,* and *special.*

*b. Daily Inspection.* The daily inspection will be accomplished following the last flight of the day or preceding the next day's flight. If the aircraft is not flown, this inspection is considered valid for 72 hours. The inspection consists of a flight readiness check. This is accomplished by performing a visual examination and operational test to discover defects and maladjustments that, if not corrected, could cause accidents or abort missions. The inspections will be accomplished in accordance with the applicable dash 20 of the TM 55-series.

*c. Intermediate Inspection.*

(1) An intermediate inspection is conducted between the daily and periodic inspection. It is basically a check of equipment to detect and correct chafing, leaks, and similar conditions before they result in major deficiencies.

(2) The intermediate inspection will be made after completion of the number of flying hours listed in the applicable inspection requirements section of the dash 20. Thus, the intermediate inspection is normally performed each

10 to 25 hours of flying time (depending on the type aircraft).

*d. Periodic Inspection.*

(1) The periodic inspection is a combination of daily, intermediate, and periodic requirements for checking equipment that requires verification of satisfactory functioning. Units are disassembled, if necessary, to ascertain wear or deterioration of parts or subassemblies. Special tools are used to determine whether items are within tolerance.

(2) A periodic inspection must be performed on the aircraft and its components at the flying hour intervals specified in the applicable dash 20 of the TM 55-series, or at any time required by Standard of Serviceability Section of the appropriate technical manual when an aircraft is transferred from one organization to another. However, a commander with command jurisdiction over both the transferring and receiving organizations may authorize transfer without this inspection.

*Note.* Under the new aircraft inspection concept based on the TM 55-series publications, the calendar inspection (intermediate and periodic) has been deleted. This should not, however, be considered a restriction of command prerogative to increase the frequency and scope of inspection. The commander should make his decision of inspection requirements on the basis of advice from his maintenance officers, local conditions, type of mission experience, utilization, geographical location, etc.

*e. Special Inspections.* Inspection or replacement of equipment and accessories is occasionally required at time intervals greater than that between periodic inspections. This may be at the expiration of a given length of time or when a particular mission, accident, or occurrence indicates the need for an inspection. Special inspections and replacements will be performed at the time specified in the applicable dash 20 of the TM 55-series.

*f. Scheduled Replacements.* The applicable inspection requirements in the dash 20 of the TM 55-series lists operating equipment that must be replaced at the expiration of specified time intervals, or at the specified time plus authorized extensions. This replacement is accomplished at specified times or at the periodic inspection nearest the time when the replacement is due. For maximum utilization of replacement accessories, TB AVN 23–10 must be consulted to effectively schedule replacement procedures.

*g. Inspection and Repair Only As Necessary (IROAN).* IROAN is that maintenance technique which determines the mini-

mum repair necessary to restore equipment, components, or assemblies to prescribed maintenance serviceability standards by utilizing all available diagnostic equipment and test procedures and by minimizing disassembly and parts replacement. IROAN is applicable to all categories of maintenance, and is accomplished by TC sections of general depots or by contract.

## 2–5. Field Maintenance

*a. General.* Field maintenance is performed by designated maintenance activities in support of the using organization. Normally, this category is divided into third and fourth echelon maintenance. Third echelon maintenance usually consists of the replacement of unserviceable parts, subassemblies, and assemblies; fourth echelon maintenance commonly includes the repair of these same items and other major items, within its capacity, for return to stock.

*b. Coordination with Field Maintenance.* Field maintenance installations will coordinate their functions with organizational maintenance units to effect a smooth, well-organized maintenance operation. Organizational units can expedite this maintenance operation by correct preparation of work orders, completion of all organizational maintenance, and completion of all liaison before evacuating the aircraft to field maintenance installations.

## 2–6. Depot Maintenance

Depot maintenance (fifth echelon) is the highest echelon of maintenance. It provides maintenance for aircraft and allied equipment which requires major overhaul or complete rebuilding of parts, subassemblies, assemblies, and/or end items. This maintenance is intended to augment stocks of serviceable equipment and to support lower levels of maintenance by use of more extensive shop equipment and personnel of higher technical skill. It normally supports supply on a rebuild and return to stock basis with operations scheduled to employ production and assembly line maintenance methods whenever practicable.

## 2–7. Contract and Manufacturers' Assistance

*a. Technical Assistance.*

(1) Technical assistance in the maintenance support of Army aircraft may be requested by the commanders of using organizations under the provisions of AR 750–5. Assistance available is in the form of one or more of the following categories.

(*a*) Regional maintenance technicians.
(*b*) Maintenance technicians.
(*c*) Contract field technicians.
(*d*) Manufacturers' representative.

(2) Detailed policy and information covering the basis for requesting such assistance, authorized use, and employment of these personnel is explained in AR 750–5, AR 750–22, and appropriate regulations of the AR 750–700-series.

*b. Contract Field Technicians.* Contract field technicians are men trained to assist organizations using their products. In the CONUS these technicians are stationed at the four General Depots for use within applicable Army areas as required. Their home station is the installation having the greatest concentration of their type aircraft in the respective Army area.

*c. Availability.* AR 750–707 explains the procurement, use, and responsibility of contract field technicians. These technicians are usually available to major commanders when—

(1) New type equipment is introduced into the command and indoctrination of personnel is necessary.

(2) Technical assistance in use of equipment (not new type) is required by the command.

(3) Qualitative and/or quantitative deficiencies exist in military or civilian personnel technical skills for logistic planning, installation, operation, and maintenance of equipment at the time of introduction into service use.

*d. Utilization.* Advice, assistance, or recommendations furnished by contract field technicians which are contrary to established logistical policies or procedures will not be acted upon by Army agencies. While rendering services at a military installation, these technicians will comply with directives and requirements issued by the commanding officer. Contract field technicians will not be used to circumvent military or civilian personnel ceilings, nor will they be assigned to perform functions for which Army personnel, military or civilian, are assigned.

# PART TWO
# MAINTENANCE SUPERVISION

## CHAPTER 3
## FUNDAMENTALS AND FUNCTIONS OF MANAGEMENT

### 3–1. Principles of Organization

An organization is an association of persons formed to attain a common purpose. It provides for a practical network of communication and control, the orderly and effective participation of members, and the execution of the plan of the leader. The four basic principles of organization are unity of command, span of control, homogeneous assignment, and the delegation of authority.

*a. Unity of Command.* The military organization, built upon unity of command, requires each individual within an organization to be responsible to his immediate superior. Each member of the organization must learn the chain of command and abide by it. Lines of authority should be short, definite, and understood by all. Each supervisor is responsible for a specific number of subordinates. He gives orders, monitors subordinates' efforts, and is the one to whom subordinates report. Bypassing the line of authority results in a divided command and inefficiencies due to confusion.

*b. Span of Control.* Span of control is that principle which limits the number of direct subordinates and the area of supervision, and economizes on the use of time. Therefore, this principle deals with three factors—numbers, distance, and time.

(1) *Numbers.* One person should not supervise less than three or more than seven subordinates. If he supervises less than three, he is doing some of the work himself, and is therefore a part-time member of the group he is authorized to direct, with clear identity in neither group. If he supervises more than seven, supervisor-subordinate relationships are increased to such an extent that efficient management is impossible.

(2) *Distance.* Subordinates and/or activities should be centrally located to permit ease of supervision. When the

distance between activity and supervisor is too great, under-supervision results.

(3) *Time.* This principle deals with the way in which the supervisor uses his time. A supervisor's job consists of three main types of work—regular, special, and creative. He schedules his time so that each type of work receives the proper amount of attention. Regular work is that which can be done only by the supervisor, such as supervising activities, initiating reports, and conducting meetings. Special work is an assignment given to a supervisor by his superior and is not related to his regular work. Creative work is that which strives to improve the regular work of the supervisor and his subordinates, such as devising new training programs or better methods of doing a job.

*c. Homogeneous Assignment.* Homogeneous assignment is the process of grouping like or related duties together at all organizational levels, and assigning personnel to these groupings according to their aptitudes and capabilities. By applying a sound analysis of the job and the individual, the highest degree of job efficiency will be attained. This will insure that—

(1) Activities do not overlap.

(2) Responsibilities are clear-cut and similar in nature.

(3) Each responsibility is assigned to some qualified individual.

(4) Improper classification and malassignment, with the accompanying morale breakdown, are avoided.

*d. Delegation of Authority.* Authority means the legal right to act; therefore, the assignment of responsibilities to subordinates must be accompanied by a delegation of authority. The supervisor, however, is still responsible for the assignment and he must fully support the actions and/or decisions of responsible subordinates. By wisely dividing responsibilities and delegating authority to his subordinates, the supervisor will have freedom of action and an organization which should function effectively in his absence.

## 3–2. Personnel Relations

*a. Objective.* The basic objective of personnel management is *maximum utilization of available manpower to achieve maximum efficiency.* The basic job of the maintenance officer is to maintain as many aircraft as possible in safe, flyable condition. To do this, the ground crew must work rapidly and efficiently. They must know their jobs, and must like and have pride in their work.

*b. Obligations of Personnel.* In a maintenance organization, each person is obligated to his associates, both legally and morally. Professional obligations involve the *individual* and the *supervisor.* Before a supervisor can adequately administer his supervisory obligations, he must be aware of his obligations as an individual.

(1) *Individual obligations.* The success of the mission is ultimately determined by the performance of each individual in the organization. Each must—

(*a*) Subordinate his personal desires to those best for the organization.

(*b*) Be loyal to superiors.

(*c*) Show initiative. Personal ideas should be submitted through a suggestion box or in conference with the supervisor.

(*d*) Work compatibly with associates. This includes respecting the rights of others, advising and helping associates, being honest, and avoiding jealousy.

(2) *Supervisory obligations.* A supervisor must be able to think clearly and rapidly, talk convincingly, listen attentively, and discriminate between right and wrong conduct and good and poor work performance. Specific supervisory obligations include—

(*a*) Realizing that the organization is composed of a group of individuals, each wanting to be treated as an individual.

(*b*) Taking a personal interest in each man.

(*c*) Carefully considering job assignments and placements.

(*d*) Recognizing efficient performance. Publicly praising an individual for a job well-done stimulates good will and cooperation.

(*e*) Punishing the guilty, not the group.

(*f*) Developing initiative through the assignment of reasonable workloads, occasional projects to be worked out by individuals, and added authority.

*c. Utilization of Personnel.* The five basic methods of using manpower wisely are—

(1) *Assigning the right man to the right job.* Personnel should be assigned the particular jobs they can do best with their present training, then be further trained on the job.

(2) *Increasing availability of manpower.* Manpower availability depends upon health, safety, and reduction in absenteeism.

(*a*) A clean, warm, dry, well-lighted working space should be provided.

(*b*) Ground safety rules, and safe practices and procedures must be enforced.

(*c*) Mechanics (military) must attend specified classes, drills, physical training activities, etc. Work should be scheduled so that these absences will not disrupt operations.

(3) *Stimulating the will to work.* This can be accomplished by the supervisor's personal interest in the men, proper training and assignments, promotions, increased responsibilities, or written commendations.

(4) *Increasing the ability to produce.* This is best accomplished through continuous training (on-the-job training if the man can produce while learning) and up-grade training (more responsible duties on larger and more complicated aircraft) for mechanics.

(5) *Fully utilizing a man on essential tasks.* This is achieved by scheduling a full day's work for each man.

## 3–3. Functions of Management

Functions of management include the actions taken by a supervisor to perform his assigned tasks. These functions include planning, organizing, directing, controlling, and coordinating.

*a. Planning.* When planning, the supervisor selects a course of action for the future. The planning function can be divided into four steps:

(1) *Understanding the mission.* Knowing what is to be done, why it is to be done, and the objective to be attained.

(2) *Evaluating the situation.* Carefully considering factors including availability of time, space, personnel, and material.

(3) *Classifying possible courses of action.* Classifying possible courses of action as suitable, feasible, and acceptable.

(4) *Selecting the best course of action.*

*b. Organizing.* Organizing is the process of arranging facilities and resources in the most systematic and practical manner to get the job done. It is a continuous process and is essential to unity of effort. The three steps involved are—

(1) Determining the job to be done.

(2) Setting up the structure to do it.

(3) Allocating required resources (time, space, material, and personnel).

*c. Directing.* Directing is essentially order-giving. Orders are issued verbally or in writing. They should be understandable, consistent with their purpose, and within the capability of the individual or unit receiving the order.

*d. Controlling.* Control is essential and must include followup procedures (reports, inspections, etc.). The controlling function can be divided into three steps:

(1) *Determining methods of control.* Determining where and to what degree controls are necessary and whether the supervisor should exercise complete control or delegate some authority to his subordinates.

(2) *Establishing performance standards.* Establishing practical standards, considering the variables of materials, personnel, equipment, and operating conditions.

(3) *Evaluating the results.* If actual performance differs from the expected, the important question is *why.* Pertinent data should be assembled and analyzed, and corrective measures taken.

*e. Coordinating.* The supervisor must coordinate his plans, policies, directives, and controls with all agencies or units affected. Coordination may be achieved by decree, but the most desirable method is by conference and agreement, followed by announcement. The manner in which the coordinating action is accomplished may determine the cooperation which follows.

# CHAPTER 4
# MAINTENANCE AND SUPPLY PERSONNEL

## 4–1. Duties

*a. Unit Commander.* The unit commander exercises direct command of the unit and is responsible for its operation, administration, maintenance, supply, and training. He assigns the maintenance officer and, to achieve flexibility of performance, other officers to assist the maintenance office.

*b. Maintenance Officer and/or Platoon Commander.*

(1) *Qualifications.* In addition to being capable of performing the duties in (2) below, the maintenance officer should have a thorough understanding of—

(*a*) Aircraft technical publications.

(*b*) Aircraft parts and supply manuals.

(*c*) Use of special equipment and tools (including precision measuring instruments).

(*d*) Principles of mechanics and physics as applied to the repair and testing of Army aircraft.

(2) *Duties.* He—

(*a*) Directs maintenance of Army aircraft and keeps the unit commander informed of the status of maintenance operations.

(*b*) Plans, schedules, and assigns work.

(*c*) Directs and instructs personnel in proper work techniques, including disassembly, assembly, and repair and testing of aircraft equipment and components such as aircraft engines, landing gears, wings, rotor blades, mast assemblies, flight controls, instruments, and fuselages.

(*d*) Assigns work priorities on the basis of tactical requirements and availability of personnel and material.

(*e*) Supervises the issue of replacement parts, supplies, tools, and equipment in the unit.

(*f*) Spot checks maintenance activities such as engine repairs and testing of hydraulic systems to insure acceptable workmanship.

(*g*) Supervises the preparation of aircraft status reports, historical records, equipment records, and maintenance scheduling.

*c. Platoon Sergeant.* The platoon sergeant is responsible to the platoon commander for the conduct of the platoon. He—

(1) Directs the work of enlisted personnel and maintains check on the status of petroleum, oil, and lubricants (POL); parts supply; wheeled vehicle maintenance; administrative records; and equipment.

(2) Supervises the requisitioning, procurement, and distribution of POL and parts, and performs other duties as directed by the platoon commander.

*d. Maintenance Supervisor.* The aircraft maintenance supervisor supervises second echelon maintenance of aircraft within the aviation company, directs the work of the mechanics within the maintenance section, and performs other duties as directed by the platoon commander.

*e. Assistant Maintenance Supervisor.* The assistant maintenance supervisor supervises and renders technical assistance on maintenance performed in the maintenance section, and assists in the supervision of enlisted personnel assigned to the section.

*f. Airfield Service Section Chief.* The airfield service section chief supervises all personnel of the service section.

## 4–2. MOS Structure

For maintenance and supply personnel prerequisites, see DA Pam 20–21; for duties, skills, and knowledge, see AR 611–201.

## 4–3. Training

*a. General.* As complexity of aircraft and components increases, the required skill of the mechanic increases. Cross-training of maintenance personnel in supply procedures promotes greater understanding and efficiency and provides a reserve of qualified personnel who can be developed quickly into competent help in either field.

*b. Methods of Training.* Methods of training (TM 9–2810) include service schools, unit schools, on-the-job training (OJT), and conferences.

(1) *Service schools.* Formal courses of instruction for most specialist personnel are taught in the Army school system. These courses are listed in DA Pam 20–21 with the subject matter to be presented and the prerequisites for attendance. The potential technician selected must possess the qualities of leadership and aptitude. He must also have sufficient service time remaining to teach the

skills learned in school to other specialists who cannot attend a formal course of instruction.

(2) *Unit schools.* Unit schools are conducted at unit, post, camp, or station level, using local instructors and facilities. These schools supplement and complement the service school system.

(3) *On-the-job training.* On-the-job training is received during the actual performance of the duty. Potentially, it is the most effective method available for the training of all personnel. The best technique for OJT is to group experienced, preferably school-trained specialists, with untrained personnel. All maintenance training, including instruction on compressors, auxiliary power units, and test equipment, is conducted under the supervision of technically trained personnel.

(4) *Conferences.* Conferences with supervisory personnel and selected specialists serve a twofold purpose—

(*a*) To inform the specialists of changes in requirements, procedures, or special problems; and

(*b*) To obtain information from the specialists concerning their problems and difficulties.

*c. Instructor Training.* Before effective training can be initiated, qualified officer and enlisted instructor personnel must be trained. The principles outlined in FM 21–5 for the selection and training of instructors will be followed. Basic points to be considered when selecting instructor personnel are that—

(1) Instructors be qualified mechanics or technicians and have at least 6 months experience.

(2) Instructors receive refresher training.

(3) Instructors receive special training in controlled observation (on-the-spot correction).

(4) Instructors receive special training in conducting and scoring tests.

*d. Continuity of Training.* Training will be continuous due to the constant turnover of personnel and changes in equipment.

*e. Army Aircraft Mobile Technical Assistance Teams.* Mobile technical assistance teams are provided by the Transportation Materiel Command, on schedule, to train troops in the field. The mobile teams, which are available to all units, are divided into teams according to type of aircraft.

# CHAPTER 5
# ORGANIZATION AND SAFETY

## Section I. ORGANIZING TO PERFORM MAINTENANCE

### 5–1. Office of the Aircraft Maintenance Officer

In combat the maintenance office is normally located in a tent, a maintenance shelter, or a shop van. The physical layout is determined by the mission of the particular maintenance organization. To facilitate aircraft maintenance, necessary records, charts, files, technical manuals, and other pertinent material must be accessible for the use of personnel. Charts serve as a ready reference for officers, inspectors, supervisors, and clerks in planning and scheduling duties and workload, and in evaluating work already performed. A complete technical reference file on all aircraft on which the unit may perform maintenance must be available to supplement the G file which accompanies each aircraft. A specific place should be provided where these references may be studied and, when possible, pertinent publications should be available for the mechanic to take to the flight line.

### 5–2. Maintenance Organization Under Combat Conditions

*a. Location.* Organizational aircraft maintenance facilities must be centrally located at the airfield or airstrip on a well-drained, hard surface. A defiladed area should be selected which is easily accessible from routes of communication and which can be camouflaged as expediently as possible. Although limited organizational aircraft maintenance is possible in the parking area, most of it will be performed in the maintenance area where special tools, compressors, power generators, and test equipment are accessible.

*b. Protection From Elements.* The organizational aircraft maintenance officer must adapt the equipment to the situation and utilize available shelter, tents, tent heaters (Herman-Nelson), tarpaulins, etc., to best advantage. A tarpaulin set on poles over a work location provides some shelter from the sun or driving rain. Maintenance shelters available to larger units can be adapted to most weather conditions.

### 5–3. Camouflage

Camouflage discipline is the responsibility of the unit commander. Since organizational aircraft maintenance installations

and Army aircraft receiving maintenance are vulnerable to enemy attack, all means of concealment and camouflage must be used. All reflective areas on the aircraft, including windshields, insignia areas, propellers, etc., will be covered with burlap or canvas carried in the aircraft for this purpose. Tools and equipment with reflective qualities will be kept under cover. Only the aircraft actually receiving maintenance will be parked in the maintenance area. Because of the difficulty of concealment in the maintenance area, strict camouflage discipline is essential.

## 5–4. Maintenance Coordination

Maintenance activities are organized to keep the maximum number of aircraft flyable. When necessary, minor repairs (cracks, dents, scratches, etc.) may be deferred until more time is available. Schedules (ch. 11) must be planned so that, if ordered to move on short notice, no aircraft need be left behind because of a nonflyable status. Aircraft disassembled for maintenance to the extent that reassembly cannot be completed in time to comply with movement order will be evacuated to the field maintenance activity. Evacuation may be accomplished by several means, including using a lowboy, towing by vehicle, or helicopter airlift. FM 1–100 describes evacuation of aircraft in detail. Close coordination will be maintained between the organizational aircraft maintenance officer and the field maintenance activity.

## 5–5. Night Maintenance

Night maintenance is particularly important during extended commitment of aircraft such as in combat or during field maneuvers. Factors to be considered in performing night maintenance are—

*a.* Location of the airstrip.

*b.* Friendly air superiority.

*c.* Available cover and defilade.

*d.* Satisfactory light facilities.

*Note.* When one or more of the above factors are unfavorable, defective parts, subassemblies, or assemblies may be removed from the aircraft during daylight hours, overhauled, repaired, and tested at night in a light-proof shelter, and replaced on the aircraft the next morning.

## 5–6. A Unit-Type SOP

*a.* A standing operating procedure (SOP) (app. II) is a set of instructions for a particular unit describing routine operational features, both tactical and administrative. SOP's reduce the number and length of orders that must be issued.

*b.* Standing operating procedures for organizational maintenance units are designed to—

(1) Simplify the preparation and transmission of orders.
(2) Simplify and perfect unit training.
(3) Promote understanding and teamwork between the commander, staff, troops, and other installations.
(4) Facilitate and expedite operations and minimize confusion and errors.

*c.* SOP's are printed in the most effective and convenient form and are changed when necessary. They may be issued as a single pamphlet; as several pamphlets, each pertaining to a separate operation; or in looseleaf form. In any case, an organizational aircraft maintenance and supply unit SOP should contain information on—

(1) Aircraft and vehicle accidents.
(2) Maintenance operations.
(3) Evacuation plan.
(4) High wind and storm procedure.
(5) Inspections.
(6) Internal and local security.
(7) Issue procedures.
(8) Liaison with field maintenance.
(9) POL procedures.
(10) Reports.
(11) Requisitions.
(12) Requisitioning schedules.
(13) Shop and line safety.
(14) Turn-in procedures.

## Section II. GROUND SAFETY IN MAINTENANCE WORK

### 5–7. General

*a. The Safety Program.* Safety rules and regulations prescribe safe methods and practices for insuring continuous production, safeguarding personnel, and preventing property damage. Although safety is considered the responsibility of the unit commander, each individual in the unit must be safety-conscious. Each echelon of command will supervise and teach personnel to work safely, eliminate hazards, enforce safety regulations, and investigate accidents.

*b. Safety Education.* Safety education is a mandatory phase of accident prevention. It assists in developing an internal safety

consciousness which, when properly ingrained, will function in any situation. Through this medium, accidents may be prevented which engineering, supervisory, or enforcement measures would not eliminate. Each accident is a symbol of some deficiency which should have been corrected *before* the accident. The "postmortem" safety program is a phase of safety education which stresses corrective action *after* an accident.

## 5–8. Prevention of Accidents

Prevention of accidents is achieved primarily by improving the individual's knowledge, skill, attitudes, and habits. Safe living requires the ability to function at optimum level in the presence of necessary hazards. Basic safety rules to observe while performing maintenance include—

*a.* Eliminating "horseplay."
*b.* Being alert at all times.
*c.* Wearing clothing of close fit.
*d.* Removing all jewelry before going on duty.
*e.* Using all available safety guards.
*f.* Using prescribed methods when moving heavy objects.
*g.* Using the right tool for the right job.

*Note.* See AR 385-series for additional safety practices.

## 5–9. Shop and Hangar Safety Measures

*a. Hand Tools.*

(1) Racks, shelves, and/or tool boxes must be provided for tools not in use to assure immediate accessibility and to eliminate the hazards created by misplaced or forgotten tools.

(2) When tools are used on ladders, scaffolds, platforms, or other elevations, special precautions will be observed to prevent them from being dropped or falling from these levels.

(3) Tools will be inspected frequently by responsible personnel and defective tools removed from service for repair or salvage.

(4) Tools with sharp cutting edges will be carried in protective covers.

(5) Portable power tools must be equipped with guards, all electrical contacts on power tools inclosed, and all wiring well insulated and grounded.

*b. Welding and Cutting Equipment.*

(1) During welding or cutting operations, extreme caution

will be observed to prevent sparks from starting fires. A fire extinguisher will always be available during these operations.

(2) Safety goggles will be provided for operators of oxyacetylene equipment.

(3) When performing electric welding, the operator will have a hand shield or helmet with a shaded filter glass, protective sleeves, gloves, and apron. When other personnel are in the vicinity, electric welding operations will be screened.

*c. Housekeeping.*

(1) Covered fire-resistant rubbish cans will be used.

(2) Self-closing covered metal waste cans will be conveniently located about the work area for the disposal of oily rags and waste.

(3) Volatile flammable liquids will not be used for washing or cleaning parts and must not remain in open containers. Working quantities of such liquids will be confined to approved containers.

(4) Dripping or spilling of oil should be prevented and suitable means provided to collect excess oil.

*d. Acids.*

(1) Rubber gloves, goggles, and aprons must be provided for all personnel handling battery acids.

(2) Where acid fumes have a toxic, corrosive, or asphyxiating action, approved respirators will be available.

(3) Slaked (hydrated) lime should be available for neutralizing large quantities of acid in the event of spillage or breakage of containers. For cleaning acid from floors or equipment, a 10 to 20 percent sodium carbonate solution should be used. All places made slippery by acid may be adequately neutralized with soda or other alkaline solution and washed with water.

*e. Static Ground.* To reduce the possibility of fire from accumulated static electricity, all aircraft stored in hangars will be provided with proper grounding devices and the aircraft static ground wire must be in contact with the ground at all times.

*f. Smoking.* Smoking will not be permitted within 50 feet of hangars, parked aircraft, and flammable liquid storage points, or inside hangars. "No Smoking" signs will be conspicuously posted in restricted areas. The commanding officer may designate specific areas where smoking is permitted.

*g. Fire Extinguishers.*

(1) Approved type, conspicuously marked fire extinguishers will be provided in hangars and on flight lines.

(2) All fire extinguishers will be properly charged and periodically tested, ready for instant use.

(3) All personnel using flammable liquids will be trained in the proper use of fire extinguishers.

## 5–10. Flight-Line Safety

*a.* Aircraft will be started, run up, or tested only by qualified aviators or qualified mechanics delegated this duty by the unit commanding officer. A list of such mechanics will be posted on the bulletin board, accessible to all aviators and mechanics (AR 95–13).

*b.* Except in emergency, wheels will be securely chocked before engines are started.

*c.* No aircraft will be taxied closer than 100 feet to a runway being used by other aircraft, except when terrain dictates or when the operator is specifically directed to do so by competent authority.

*d.* When an aircraft is being taxied close to other aircraft, buildings, or other obstructions, or during gusty or high winds, a member of the ground crew must be stationed at each wingtip to assure adequate control and guidance.

*e.* Personnel will not ride on the wing, empennage, or other external parts of the aircraft while it is being taxied.

*f.* When the aircraft is being towed, a qualified mechanic or pilot will be in the cockpit to use brakes as necessary.

## 5–11. Martin-Baker Ejection Seat

This ejection seat is not operationally dependent on interlock with the canopy. Since this seat is automatic, extreme care must be exercised by personnel working in and around a cockpit equipped with the seat. *To insure the safety of maintenance personnel, ground safety locks and safety pins supplied with this seat MUST BE INSTALLED immediately after completion of a flight.*

# CHAPTER 6
# PETROLEUM, OILS, AND LUBRICANTS

## Section I. PETROLEUM FUELS

### 6–1. Properties of Fuel

*a. Octane Ratings.* Octane rating is a number assigned to a liquid fuel to designate its relative antiknock value in a spark-ignited, internal combustion engine. Octane number is not a measurement of power. The higher the octane number, the more compression the fuel can withstand without detonation. Fuel with an octane rating below 100 is compared to a blend of iso-octane and normal heptane. These two fuels can be blended to any desired octane number from 0 to 100. Aircraft fuels are graded by two numbers, such as 100/130 or 91/96. Under this grading, the first number indicates a rating at lean mixture conditions and the second a rating at rich mixture. When the fuel grade includes a number of 100 or less, it is an *octane number.* If the number is 100 or above, it indicates the relative power that the engine can develop safely with equal knocking tendency and is known as *performance number.* Hence, grade 100/130 indicates that the lean mixture rating is 100 (performance or octane number) and that the rich mixture performance number is 130. The performance number 130 indicates that the engine will develop 1.3 times as much knock-free power on this fuel under rich mixture conditions as on a fuel having a rich performance number of 100. Grades of fuel most commonly used in Army aircraft may be identified by color as follows:

(1) 115/145—purple.
(2) 100/130—green.
(3) 91/96—blue.
(4) 80/87—red.
(5) All lower grades—clear.

*Note.* The grade 80/87, red colored aviation fuel, is NOT to be confused with red colored "mogas" which is fuel for wheeled vehicles.

*b. Volatility.* Volatility is the vapor forming tendency of a fuel. Fuel that is too volatile will cause vapor locks in the fuel system; that which is not sufficiently volatile will not vaporize readily for cold engine starting.

*c. British Thermal Units (Btu's).* Heat value of a fuel is rated in British thermal units (Btu's) (table I). One Btu is the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near its point of maximum density. The higher the Btu rating of a fuel, the more power is available for use.

*Table I. Properties and Characteristics of Aviation Gasoline*

| Requirements | Fuels | | | |
|---|---|---|---|---|
| Grade | 80/87 | 91/96 | 100/130 | 115/145 |
| Distillation: | | | | |
| 10 percent evaporated (max) | 167° F. | 167° F. | 167° F. | 167° F. |
| 40 percent evaporated (min) | 167° F. | 167° F. | 167° F. | 167° F. |
| 50 percent evaporated (max) | 221° F. | 221° F. | 221° F. | 221° F. |
| 90 percent evaporated (max) | 275° F. | 275° F. | 275° F. | 275° F |
| End point (max) | 338° F. | 338° F. | 338° F. | 338° F. |
| Residue, vol percent (max) | 1½ | 1½ | 1½ | 1½ |
| Distillation loss vol percent (max) | 1½ | 1½ | 1½ | 1½ |
| Existent gum, mg/100 ml (max) | 3.0 | 3.0 | 3.0 | 3.0 |
| Potential gum, 16 hour aging, mg/100 ml (max). | 6.0 | 6.0 | 6.0 | 6.0 |
| Sulfur, total, percent weight (max) | 0.05 | 0.05 | 0.05 | 0.05 |
| Reid vapor pressure, 100° F., psi (min). | 5.5 | 5.5 | 5.5 | 5.5 |
| Reid vapor pressure, 100° F., psi (max). | 7.0 | 7.0 | 7.0 | 7.0 |
| Freezing point, ° F (max) | —76 | —76 | —76 | —76 |
| Corrosion, copper strip | Slight | Slight | Slight | Slight |
| Water tolerance, ml (max) | 2 | 2 | 2 | 2 |
| Heating value: | | | | |
| Heat of combustion (lower or net) Btu/lb. (min). | 18,700 | 18,700 | 18,700 | 18,900 |
| or | | | | |
| Aniline-gravity product (min) | 7,500 | 7,500 | 7,500 | 7,500 |
| Color | Red | Blue | Green | Purple |
| Tetraethyl lead content, ml/U.S. gallon (max). | 0.50 | 4.60 | 4.60 | 4.60 |
| Knock rating, lean mixture (min) | 80.0 | 91.0 | 100.0 | 115.0 |
| Knock rating, rich mixture (min) | 87.0 | 96.0 | 130.0 | 145.0 |

*d. Icing and Water Tolerance.* Fuel specifications are intended to prevent the addition of components that might separate on contact with water, and to insure that fuels will not absorb excessive quantities of water. If flight level temperature is at freezing or below, water may separate and form ice crystals which may restrict fuel flow to the engine.

*e. Aromatics in Fuels.* Aromatics in fuels have high antiknock

properties but are damaging to some types of rubber and tend to absorb more water into the fuel. Because of these undesirable qualities, the amount of aromatics in fuels does not normally exceed 20 percent.

## 6–2. Characteristics of Gasoline

*a. Explosive Properties.* Gasoline is a highly volatile liquid fuel giving off a vapor which, when combined with air in proper proportion, forms an explosive mixture that can be ignited by a slight spark or flame. A violent explosion followed by fire can result if liquid gasoline is present. At ordinary atmospheric temperatures, air can absorb as much as 28 percent gasoline vapor, the amount depending on the volatility and grade of the gasoline.

*b. Formation of Explosive Mixtures.* A small amount of gasoline will produce a large volume of explosive mixtures. Since a cubic foot of gasoline weighs approximately 44.9 pounds and a cubic foot of air at standard atmosphere weighs approximately 0.08 pound, a cubic foot of gasoline would form a combustible mixture with a volume of from 4,480 to 10,100 cubic feet.

*c. Behavior of Gasoline Vapor.*

(1) Because it is heavier than air, the highest percentage of gasoline vapor is above the liquid surface of storage space; however, the vapor gradually spreads throughout the upper part of the container. Since small leaks are difficult to prevent, there is danger from sparks or flame wherever gasoline is used or stored.

(2) Gasoline vapor may be ignited after it has traveled some distance along a current of air. The flash will travel rapidly back to the source of supply which may be at some distance from the spark or flame. When a compartment containing gasoline is connected with other compartments by an open pipe or drain, gasoline vapor may leak into them and be ignited by a spark or flame. A scupper pipe or drain line which has been contaminated with gasoline must be thoroughly flushed with water.

## 6–3. Use of TCP in Gasoline

*a. General.* Tricresyl phosphate concentrate (TCP) is a fuel additive for reducing spark plug lead fouling in engines. Spark plug lead fouling has been found in engines using MIL–F–5572 specification fuel-grades 91/96, 100/130, or 115/145.

(1) TCP is used with highly leaded fuel to increase the life and reduce fouling of spark plugs. Lead deposits formed in the combustion chamber because of high content of

lead can short out spark plug electrodes, resulting in misfires, or cause preignition by continuing to glow after combustion. TCP does not prevent the formation of lead deposits, but does alter the electrical resistance characteristics and temperature resistance to a point where the effect on spark plug fouling and preignition is minimized. Lead deposits may be found in cylinders of engines in which fuel additives have been used; however, this does not indicate that the additive is not accomplishing its purpose.

(2) TCP is most effective when used continuously from the first operation of a new or overhauled engine; it will have no effect on lead deposits already formed in an engine by the combustion of untreated fuels. However, if new or reconditioned spark plugs are installed at the time TCP use is begun, engine performance should improve. If untreated fuel is used for a short time during an emergency, spark plugs must be removed and inspected for lead deposits before operation on treated fuel is resumed. If lead deposits are found, the spark plugs should be changed.

*b. Adding TCP to Fuel.* TCP will be blended with fuel in accordance with specifications and directions in TB AVN 23–2.

## 6–4. Aviation Jet Fuels

*a.* JP–4 (jet fuel) is a blend of refined products ranging from heavy gasoline through kerosene to gas-oil, or heavy diesel engine fuel (table II). The vapor pressure or volatility of JP–4 is relatively low due to the specification requirement for vapor pressure of 2 psi minimum to 3 psi maximum. *This does not mean that JP–4 is safer than gasoline to handle and store.* Personnel must be informed of the potential hazards of handling and storing JP–4.

*Table II. Properties of Jet Fuels*

| Requirements | Fuel | | | Test method | |
|---|---|---|---|---|---|
| | Grade JP-3 NATO symbol none | Grade JP-4 NATO symbol F-40 | Grade JP-5 NATO symbol F-42 | Federal test method standard No. 791 | ASTM standards |
| Distillation: | | | | | |
| Initial boiling point | (1) | (1) | (1) | | |
| Fuel evaporated, 10 percent min. at. | (1) | (1) | 400° F. (204.4° C.) | | |
| Fuel evaporated, 20 percent min. at. | 240° F. (115.6° C.) | 290° F. (143.3° C.) | (1) | | |
| Fuel evaporated, 50 percent min. at. | 350° F. (176.7° C.) | 370° F. (187.8° C.) | (1) | | |
| Fuel evaporated, 90 percent min. at. | 470° F. (243.3° C.) | 470° F. (243.3° C.) | (1) | 1001 | D86 |
| End point, max | (1) | (1) | 550° F. (287.8° C.) | | |
| Percent evaporated, at 400° F. (204.4° C.). | (1) | (1) | | | |
| Residue, vol. percent max | 1½ | 1½ | 1½ | | |
| Distillation loss, vol. percent max. | 1½ | 1½ | 1½ | | |
| Gravity ° API—min. (specific gravity, max.). | 50.0 (0.780) | 45.0 (0.802) | 36.0 (0.845) | 401 | D287 |
| Gravity ° API—max. (specific gravity, min.). | 60.0 (0.739) | 57.0 (0.751) | 48.0 (0.788) | 401 | D287 |
| Existent gum, mg/100 ml, max. | 7 | 7 | 7 | 3302 | D381 |
| Potential gum, 16 hr. aging, mg/100 ml, max. | 14 | 14 | 14 | 3354 | [2] D873 |

See notes at end of table.

*Table II. Properties of Jet Fuels*—Continued

| Requirements | Fuel | | | Test method | |
|---|---|---|---|---|---|
| | Grade JP-3 NATO symbol none | Grade JP-4 NATO symbol F-40 | Grade JP-5 NATO symbol F-42 | Federal test method standard No. 791 | ASTM standards |
| Sulfur, total, percent wt. max | 0.4 | 0.4 | 0.4 | 5201 | D1266 |
| Mercaptan-sulfur, percent wt. max.[3] | 0.005 | 0.001 | 0.001 | 5204 | D1219 or D1323 |
| Reid vapor pressure, 100° F. psi, min. (gm/cm 2, min.). | 5.0 (351.6) | 2.0 (140.6) | | 1201 | D323 |
| Reid vapor pressure, 100° F. psi, max. (gm/cm 2, max.). | 7.0 (492.2) | 3.0 (210.9) | | 1201 | D323 |
| Freezing point, ° F., max | —76° (—60° C.) | —76° (—60° C.) | —55° (—48° C.) | 1411 | D1477 |
| Thermal value: Heat of combust. (lower or net) Btu/lb min. | 18,400 | 18,400 | 18,300 | 2502 | |
| or Aniline-gravity product, min. | 5,250 | 5,250 | 4,500 | 3601 and 401 | D611 and D287 |
| Viscosity, centistokes at —30° F. (—34.4° C.), max. | | | 16.5 | 305 | D445 |
| Aromatics, vol. precent max | 25.0 | 25.0 | 25.0 | 3703 | D1319 |
| Olefin, vol. percent max.[4] | 5.0 | 5.0 | 5.0 | 3703 | D1319 |
| Smoke point, mm min | (1) | (1) | 19.0 | 2107 | D1322 |
| Explosives percent max | | | 50 | 1151 | |
| Smoke volatility index, min | 52.0 | 52.0 | | | |
| Copper strip corrosion, ASTM classification, max. | No. 1 | No. 1 | No. 1 | | [5] D130 |
| Water reaction, vol. change, ml, max. | 1 | 1 | 1 | 3251 | |

| | | | | | |
|---|---|---|---|---|---|
| Flash point, min | | | 140° F. (60.0° C.) | 1102 | D93 |
| Thermal stability | | (1) | (1) | 3464 | |
| Change in pressure drop in 5 hr, in. Hg. | | (1) | (1) | 3464 | |
| Preheater deposit | | (1) | (1) | 3464 | |

1 To be reported—not limited.

2 Use steam jet method of D381 after oxidation.

3 The mercaptan-sulfur determination may be waived at the option of the Inspector, if the fuel is considered "Doctor sweet" when tested in accordance with Method 5208 of Federal Test Method Standard No. 791.

4 May be reported as Bromine No. when specified by the armed service for whom the material is approved.

5 To be performed in accordance with paragraph titled, "Tests at 212° F. for Aircraft Engine Fuels" of ASTM D130–56. Earlier ASTM methods are not applicable since they require a dry sample.

*b.* In physical characteristics, JP–4 fuel varies from gasoline. Explosive mixtures of JP–4 vapors and air are formed in the temperature range of —10° F. to +80° F. Therefore, the prevailing temperatures throughout most of the world are adaptable to explosive mixtures of JP–4 either in storage tanks or in aircraft. This means that the vapors contained over the liquid level in tanks of JP–4 fuel are usually instantaneously explosive to fire, sparks, or ignition of any kind. Electrostatic bonding and grounding of tank refuelers and aircraft must be accomplished prior to opening the fuel tank and must be verified by responsible personnel.

*c. The Problem of Water Contamination is Much More Critical for JP–4 Fuel Than for Aviation Gasoline.* The greater density of JP–4 fuel prevents the water from settling to the bottom as rapidly as it does in gasoline. The condensed water may freeze before it reaches the aircraft sumps; ice particles may clog the fuel screens, resulting in engine starvation. Jet engine aircraft usually operate through larger temperature changes than piston engine aircraft. This results in more condensation when warm, damp air is drawn into the cold tanks as the aircraft descends.

## 6–5. Contamination

Fuel contamination refers to fuel that is mixed with water or other foreign substances and is a contributing factor to engine malfunction. Acceptable aircraft fuel is clean, bright, and contains no free water. "Clean" means the absence of sediment or emulsion; "bright" refers to fluorescent appearance of fuel which is not cloudy or hazy. When a clean, bright fuel cools, a light cloud may form which indicates that a small amount of "free water" has dissolved in the fuel and precipitated out in cooling.

## 6–6. Action of Contaminant Particles on Fuel Systems

Foreign particles may enter aviation fuels from tanks, pipes, hoses, or pumps which contain or transport fuel. Bits of rust, paint, metal, or rubber are sometimes found in fuel samples, rust being the most common. Contaminant particles in the fuel system cause obstructions in passages and orifices which are vital to free flow and pressure metering. Even a momentary starvation of fuel may cause engine malfunction. The accumulation of contaminant particles upsets correct carburetor flow; adjustments become more difficult, and finally impossible.

*a.* Particles so small they can be measured only by the micron scale can cause serious trouble. One inch equals 25,400 microns, or one millimeter equals 1,000 microns (fig. 6–1).

*b.* Particles are either coarse or fine. The 10-micron size is the

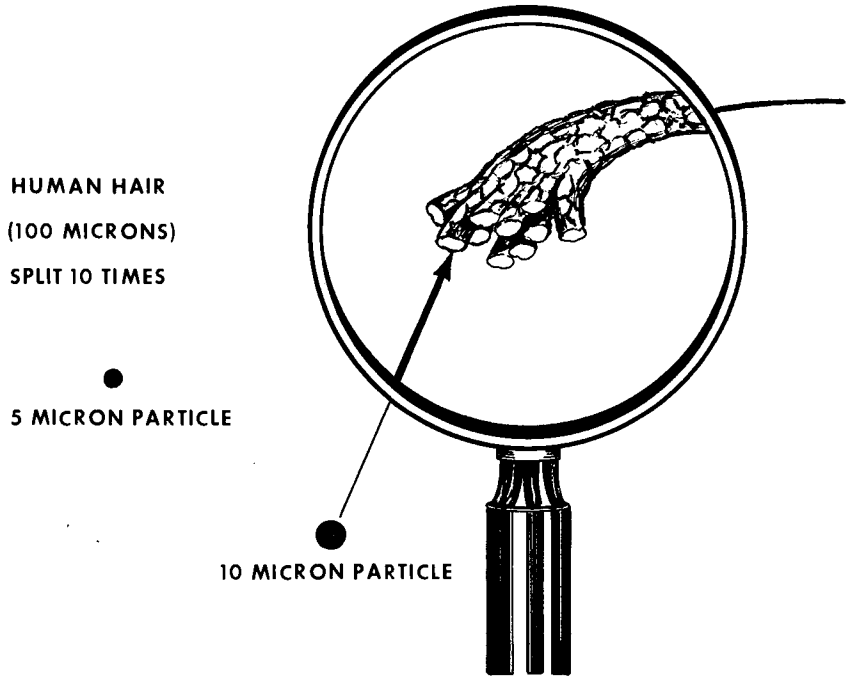



*Figure 6–1. Enlargement of small particles and their comparison to human hair.*

dividing point. Fine particles, those less than 10 microns in size, are invisible in liquid fuel unless they accumulate; then, they appear as a cloud.

*c.* Micronic filters are used to remove fine particles from liquid fuel. "Micronic" refers to the size of particles that the filter will remove. For example, a 5-micron filter removes particles of 5 microns or larger. These filters are masses of cellulose material, such as paper or compressed fibers. The greater the mass of material, the greater the number of particles the filter will remove. The density to which the fibers are compressed determines the size of particles removed. Another factor is the pressure with which the fuel is forced through the filter. In general, the greater the fuel pressure, the more particles will be forced through the filter.

*d.* A wire sieve or strainer is usually used to remove coarse particles from liquid fuels. The finest strainer in use today is the No. 400 (U.S. sieve number) which has slightly more than 400 meshes per linear inch. This strainer will strain out 37-micron and larger particles. The more common strainers are the No. 100 and No. 200, which are used to keep large particles from entering pumps and meters.

### 6–7. Water in Fuel

*a.* Water is one of the most common forms of fuel contamination. It remains in tanks from ballasting or flushing or may enter tanks along with fuel. It enters through leaks or condenses from the air. Small percentages of fresh water can dissolve in liquid fuel and become invisible. When salt water dissolves in aviation fuels, minute crystals of salt remain. Both fresh and salt water may be in the form of very fine droplets which appear as a cloud, as larger droplets which cling to the sides of a container and behind baffles or recesses in the aircraft tanks, as gross amounts which settle to the bottom, or as part of emulsions. Fuel containing water must be recirculated through a filter-separator.

*b.* Emulsions are liquids suspended in other liquids. One form of emulsion is water suspended in fuel where fine droplets of water form a cloud. Another type of emulsion is the suspension of droplets of fuel in water. These emulsions generally appear as a dark-colored, stringy material which contain 50 to 70 percent water, 30 to 50 percent fuel, and a small amount of rust. The rust stabilizes the emulsion as it forms. The emulsion may stand for months without separating. It may cling to the sides of tanks and may not be noticed when a sample of fuel is dipped or drained from the tank.

### 6–8. Mixed Fuels

Mixing fuels of different octane ratings will result in a fuel equivalent to the lower octane rating. Each type must be handled in a separate system of tanks, lines, and pumps, all of which must be clearly marked. The different grades of aviation gasoline are identified by color (par. 6–1) ; jet fuels are clear or straw colored. Mixing of fuels is difficult to detect, and only personnel with considerable fueling experience are able to detect the slight changes in color and odor. If more than one grade of gasoline is stored in a multicell tanker with a single pumping system, TM 10–1113 will be followed.

## Section II. OILS AND LUBRICANTS

### 6–9. Functions of Lubricants

The basic function of lubricants is to reduce friction and heat. All oil lines on an aircraft are color-coded yellow.

### 6–10. Types, Properties, and Grades of Lubricants

*a. Types of Lubricants.* Lubricants are basically of three types

—animal, vegetable, and mineral. Mineral lubricants, which have excellent lubricating properties and are chemically stable, are used for aircraft engine lubrication. Grease is a semisolid lubricant made mainly from oil and soap. Different types and amounts of soap determine the type of grease, such as wheel bearing, water pump, or high and low temperature grease.

*b. Properties and Grades of Lubricants.*

(1) *Viscosity.* Viscosity refers to the internal friction or resistance of a liquid to flow as measured by the Saybolt Viscometer. The oil to be tested is heated to a predetermined temperature (210° F. for grade 1,065 and above; 100° to 130° F. for grades below 1,065). Sixty cubic centimeters of this heated oil are then allowed to flow through the metering orifice of the Saybolt Viscometer. The number of seconds required for this amount of oil to flow through the orifice determines the viscosity rating.

(2) *SAE viscosity numbers.* SAE is the viscosity number given to lubricating oils by the Society of Automotive Engineers. Doubling the SAE viscosity number of oil denotes the commercial aviation grade of the same lubricating oil; adding 1000 to the commercial aviation grade number expresses the military specification. For example, SAE 40 $\times$ 2 = 80 (commercial aviation grade) + 1000 = 1080 (military specification).

## 6–11. Effects of Temperature Changes in Lubricants and Their Designation

*a. Pour Point.* The temperature at which oil ceases to flow is known as the *pour point.* It is determined by placing oil in a cylindrical tube with a thermometer extending down into the oil through an opening in the stopper. When the oil has been chilled to a point where it will not flow for five seconds with the tube in a horizontal position, 5° F. is added to the thermometer reading to obtain the pour point temperature.

*b. Flash Point.* The *flash point* of a petroleum product is the temperature at which it will discharge enough vapor to ignite momentarily when a flame is applied. Petroleum lubricants have a flash point ranging from 275° F. to 700° F.

*c. Fire Point.* The temperature at which petroleum products will discharge enough vapor to *support* a *flame* is known as the *fire point.* This is usually about 10° F. to 70° F. higher than the flash point.

### 6–12. Oil Servicing Equipment

*a. General.* Grade 1100 and/or 1065 oil will be serviced through a funnel or nozzle equipped with a 60-mesh or finer screen. These screens will be inspected daily. If contamination is noted, prompt action will be taken to eliminate the source.

*b. Jet Engine Oil Servicing.* Jet engine oil will be serviced through a funnel or nozzle equipped with a 100-mesh or finer screen. These screens will be inspected daily. If contamination is noted, prompt action will be taken to eliminate the source.

*c. Static Discharge Strap.* Oil servicing vehicles will be equipped with a static discharge device (strap) of which at least 4 inches will contact the ground when the vehicle is empty.

*d. Bonding.* When servicing aircraft with oil, the aircraft and servicing vehicle will be connected to a low resistance ground and bonded together by a bonding cable attached to a part of the aircraft away from the gas tank and to the piping on the vehicle.

## Section III. FUEL SERVICING PRACTICES, INSPECTIONS, AND TESTS

### 6–13. Fuel Servicing Practices

*a.* Fuel servicing equipment will approach the aircraft to be serviced so that the operator's side of the equipment is adjacent to the aircraft, approximately parallel to the front, and parked at the distance established by the commanding officer of the activity.

*b.* After the servicing unit is parked in position for fueling, the engine of the prime mover will be stopped if not equipped with a flame arrester muffler. The door on the driver's side of the prime mover will be left open.

*c.* Fuel servicing will not be permitted if a major spillage of fuel is detected within 50 feet of the aircraft.

*d.* The fuel nozzle will be statically bonded to the aircraft before the fuelcap on the aircraft is removed. The hose will be placed in position for the fueling operation and all static bonding completed before starting the pumping engine or engaging the power takeoff on the prime mover.

### 6–14. Technical Requirements in Fuel Servicing

*a. Prevention of Fuel Contamination.* Fuel drums or gasoline cans will be kept clean and free of contamination. Each time fuel is to be used from containers, a visual contamination check will be made. As a further precaution, fuel will be strained through an approved filter.

(1) When fueling from drums or cans, proper bonding and grounding operations will be observed. For convenience, drums should be placed near grounding post.

(2) Before the tank cover is opened, proper grounding sequence will be checked; i.e., from drum to ground, ground to aircraft, drum to aircraft, and nozzle to aircraft.

*b. Equipment Requirements.*

(1) Fuel servicing equipment should be capable of delivering a minimum of 30 gallons of fuel per minute through one hose with one meter, not to exceed 35 psi into a 1½- to 3½-inch aircraft filler neck opening. However, the actual servicing rate to any aircraft may be timed so that there will be no spillage.

(2) Fuel servicing hose will be of a type resistant to aromatic fuels in concentrations up to 30 percent. Hose should be a minimum of 50 feet in length and sufficiently bonded to insure positive grounding.

(3) Fuel servicing nozzles will be equipped with a screen of 200 mesh or finer when servicing fuel into aircraft to safeguard against the effects of deterioration of the filter or interior of the hose. Nozzle screens will be inspected daily. If contamination from solids is visible, corrective action will be taken immediately to remove the source of contamination.

(4) The fuel servicing equipment will be constructed and equipped so that the fuel delivered into the aircraft has been filtered to a degree of 5 microns. All filters will be equipped with gages to indicate the pressure differential between the intake and discharge side of the filter cartridges. Readings from the gages will be taken one or more times daily to determine if filter cartridges or elements are operating properly. Any decrease of differential pressure indicates a ruptured filter and requires immediate corrective action.

(5) Fuel servicing equipment will be fitted with automatic and/or manual valves installed at the lowest point in the tank, for removal of water.

## 6–15. Fuel Servicing Precautions

*a.* All personnel will be trained in the observance of fire prevention safety procedures and in the use of fire extinguishers.

*b.* Refueling will be discontinued immediately if deficiencies of

a fire-hazardous nature are detected in equipment, and the equipment removed from the vicinity of the aircraft until repaired.

*c.* Equipment compartments and exterior surfaces will be kept clean of all superfluous oil, grease, and fuel accumulations. Fuel spillage on exterior surfaces should be flushed with water or removed with a cloth saturated with water. *Wiping cloths will not be stored on the equipment.*

*d.* Parking areas for fuel servicing equipment, and adjacent areas, will be kept free of accumulations of oil, grease, fuel, and debris.

*e.* Fuel servicing personnel will not fuel or defuel aircraft unless firefighting equipment and personnel are available within a "reasonable distance," as determined by the activity commanding officer or his authorized representative.

*f.* Carbon-dioxide ($CO_2$) extinguishers or an equivalent quick-smothering agent will be available on powered equipment used in the support of fueling. Access to fire extinguishers on vehicles will not be obstructed.

*g. Smoking is prohibited.*

*h.* Static electricity is not apparent until a discharge or spark occurs. It can be generated by fuel flowing through a hose or by fuel falling freely through the air, as when a tank or line is drained into a barrel. Static electricity may accumulate on an aircraft during flight or on the ground; it can also be collected by induction from electrically charged atmosphere. Particles of rain, snow, ice crystals, or dust blowing across the aircraft can produce a heavy charge of static electricity. The servicing truck, like any rubber-tired vehicle, may become statically charged.

*i.* If all individual metallic structures in an aircraft are bonded or connected electrically, the flow continues until the static potentials are equal. Electricity flows along the path of least resistance, just as lightning follows a highly conductive copper lightning rod and cable into the ground. If no easy path is provided, the charge builds up. Then, when the charge is great enough, or when the distance to the ground or to the point of lower potential is sufficiently reduced (as when the hose nozzle nears the wing), the static charge jumps the gap as a static spark. This static spark is as capable of igniting flammable vapors as is the arc across the points of a spark plug.

*j.* Correct bonding will equalize the potentials and proper grounding will drain off the static charges, with no spark resulting (fig. 6–2). Grounding facilities for aircraft and mobile fuel

servicing equipment include special electrodes, consisting of pipes or rods one-half to three-fourths of an inch in diameter, driven into the ground to a point below the permanent ground moisture level.

*Note.* A drag chain on the truck does not constitute an adequate ground.

*k.* When fuel is stored in drums or tank trailers, NO SMOKING signs will be posted prominently in the area and the rule strictly enforced.

*l.* The area around storage containers will be kept clear of all rubbish or other flammable material.

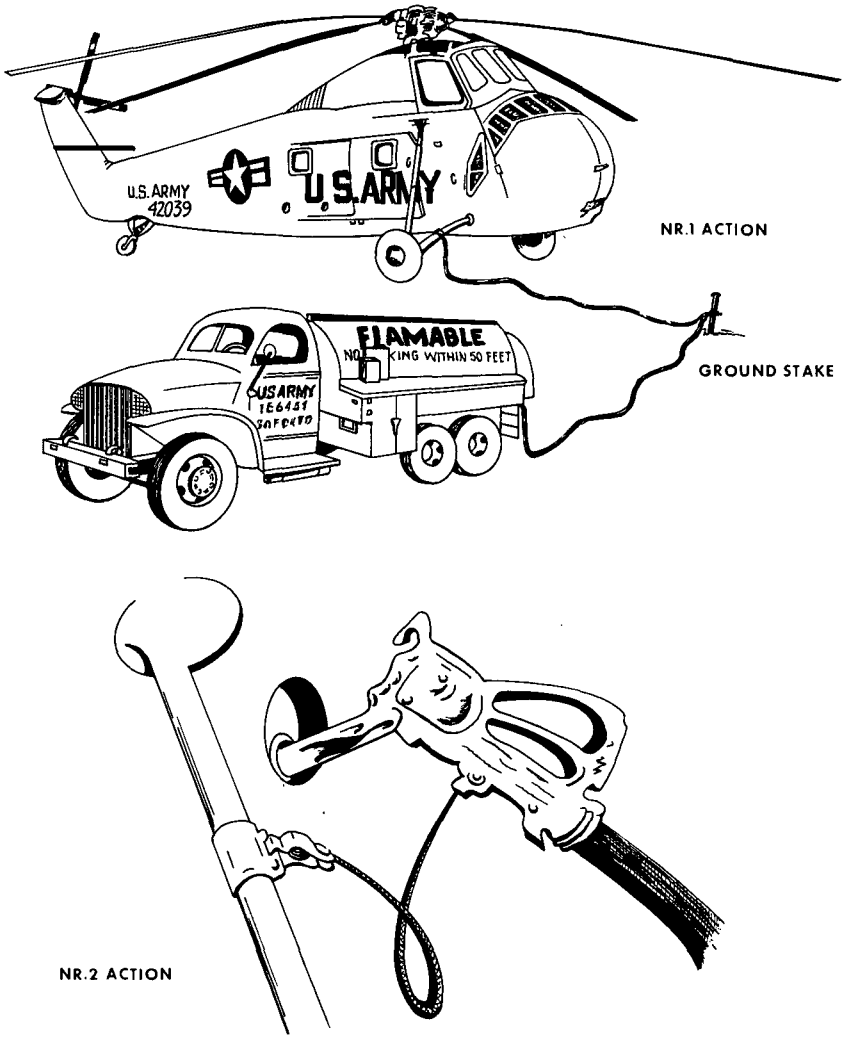



*Figure 6–2. Grounding and bonding techniques for refueling operations.*

*m.* Sawdust will not be used for absorbing oil. Sand is recommended.

*n.* An aircraft will not be serviced with fuel while its radio or radar transmitting equipment is in operation.

## 6–16. Precautions During Abnormal Fueling Operations

The installation or airport fire department will be notified in advance as to location and time of *abnormal* fueling or defueling operations. Abnormal operations include—

*a.* Fueling experimental aircraft or use of fueling systems with which servicing personnel are not thoroughly familiar.

*b.* Servicing a fueling system or unit which has been repaired.

*c.* Servicing an aircraft whose fuel system has been repaired or modified.

*d.* Fueling or defueling under exceptional circumstances which may involve hazards beyond the control of operating personnel.

## 6–17. Safety Measures in Handling POL

*a.* All local safety precautions and traffic regulations will be observed.

*b.* All operators of prime movers for fuel equipment will be military-licensed vehicle operators.

*c.* Fuel and oil servicing trucks and trailers will be painted and marked as authorized.

*d.* Tractors and trailers will be equipped with the prescribed minimum clearance, tail, turn, and spot lights. These lights will be maintained in operating condition. Windshields and cab glass will be clear and clean.

## 6–18. Inspections

*a.* Vehicle grounding devices will be inspected daily.

*b.* Separators will be drained daily for removal of water.

*c.* Chemical analysis will be made of all bulk fuel received.

*d.* Fire extinguishers will be inspected for broken seals.

*e.* Fuel stored in 55-gallon drums or 600-gallon tank trailers will be inspected for water and/or sediments (table III).

*Table III. Quality Control for Aviation Fuel and Handling Equipment*

| Quality Control Checklist | MAINTENANCE RESPONSIBILITIES FOR AVN HANDLING EQP | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Aviation Fuel | | | | 1st and 2d Echelon | | | | | | 3d and 4th Echelon | | | | | | | | Other | | | | | |
| Aircraft | Sampling Visual Test | Sampling Field Test | Sampling Lab Test | Gauging | Water Separator | Truck Chassis | Cleaning Storage Tanks | Dispensing System | Filter System | Pipe Lines | Preventive Maint. Inspect. | Truck Chassis | Storage Tank | Dispensing System | Filter System | Pipe Lines | Rust-proofing Storage Tanks | Command Maint. Inspect. | Painting and Marking Equip. | | | | | |
| Refuelers | Operator Quartermaster | Quartermaster | Quartermaster | Operator Quartermaster | Operator Quartermaster | Not Applicable | Quartermaster | Operator Ordnance | Operator Ordnance | Not Applicable | Operator Ordnance | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Ordnance | Ordnance | | | | | |
| Permanently Installed Storage and Dispensing Equipment | Operator Quartermaster | Quartermaster | Quartermaster | Operator Quartermaster | Operator Quartermaster | Not Applicable | Quartermaster | Operator Engineer | Operator Engineer | Operator Engineer | Operator Engineer | Not Applicable | Engineer | Engineer | Engineer | Engineer | Engineer | Engineer | Engineer | | | | | |

## 6–19. Types and Frequency of Fuel Checks and Tests

*a.* Visual Checks. A visual check of aviation fuel provides certain basic safeguards: color identifies grade and type, cloudiness indicates water, foreign matter indicates rust or other sediment. Since a small percentage of water or foreign matter will cause trouble, fuel will be sampled and inspected. Color, brightness, and clearness of the fuel will be checked. If contamination is observed, the source must be determined, the aircraft defueled, and the tanks cleaned.

(1) The above check will be made by pilot or crew member prior to each flight and after refueling operations by following instructions in flight handbook for subject aircraft.

(2) Aviation fuel in refuelers will be checked daily by servicing crew and weekly by quartermaster petroleum technician.

*b. Field Tests.* Field tests can be made to assure that quality standards on principal characteristics of aviation fuel meet an acceptable level. Such tests will be conducted by quartermaster technician using petroleum test kits.

*c. Additional Fuel Tests.*

(1) Samples should be withdrawn weekly from aircraft on a spot check basis and field tested.

(2) Samples will be drawn through filter-separator system on tank trucks or trailers on a spot check basis and field tested.

*Note.* When doubt exists as to the quality of the fuel or when contamination is suspected, the nearest Quartermaster POL installation should be requested to check the suspected fuel or fuel tanker.

# CHAPTER 7
# TECHNICAL INSPECTIONS AND MAINTENANCE STANDARDS

## Section I. TECHNICAL INSPECTIONS

### 7–1. Quality Control Through Technical Inspections

*a.* Frequent and competent technical inspection of aircraft maintenance and equipment is the basis of good quality control. Repeated rejects on final inspection indicate quality control laxity, which adversely affects organizational efficiency.

*b.* As maintenance on the aircraft progresses, the work is continuously inspected. When the crew chief or mechanic reports an aircraft ready for flight after maintenance, the technical inspector will check for quality and completeness of work and general condition of the aircraft. Test flight is performed in accordance with TB AVN 23–16.

*c.* Technical inspections will also reveal discrepancies that require the replacement of a repair part. Any repair part needed in the maintenance of aircraft must be requested immediately.

### 7–2. Standards of Work Performance

A high standard of work performance is the objective for supervisors and is a yardstick for evaluating any maintenance activity.

### 7–3. Technical Inspector (Aviation Company)

The duties of the technical inspector in the maintenance section of an aviation platoon are determined by the type and needs of the organization as detailed by the unit maintenance officer. This technical inspector must be trustworthy, respected by other mechanics, and thoroughly trained in his MOS. He will inspect all unit maintenance at specified intervals to insure that a high standard of maintenance prevails.

### 7–4. Technical Inspector (Field Maintenance)

The technical inspector (field maintenance) verifies the extent of work requested by the requesting unit, determines necessary work which has not been requested and, when directed by higher headquarters, performs command and spot check inspections of organizational aircraft (par. 7–5).

### 7–5. Types of Inspections

The two types of inspections performed on organizational equipment are *command* and *spot check*. AR's 750–1, 750–5, 750–8, and 750–725 prescribe procedures for conducting these inspections.

*a.* Command maintenance inspections are performed periodically by higher headquarters to determine the degree of proficiency and to insure correct observance of supply economy procedures, compliance with organizational maintenance and technical supply principles, and proper use of maintenance equipment. Command maintenance inspections are the responsibility of those commanders listed in paragraph 1*b*, AR 750–8.

*b.* Spot check inspections are conducted periodically by the commanding officer of the aircraft field maintenance facility to determine the condition of aircraft maintenance records, and technical supply and maintenance operating procedures of the Army aviation section. These inspections may be executed in conjunction with maintenance and supply assistance service (AR 750–214). At the conclusion of the inspection, deficiencies found and necessary corrective action will be reported to the aviation officer.

### 7–6. Grading System

*a.* The numerical rating for inspection of shop operations and supporting supply activities is obtained by adding values given for each item. A total score of 100 can be obtained for each operation inspected.

(1) 100–94 rates *Superior.*
(2) 93–87 rates *Excellent.*
(3) 86–80 rates *Good.*
(4) 79–70 rates *Fair.*
(5) Under 70 rates *Unsatisfactory.*

*b.* AR's 750–8 and 750–725 cover the method of arriving at the ratings in *a* above.

*c.* Reinspection is required of any section receiving an unsatisfactory rating; the date to be determined by the inspecting team commander.

*d.* Appendix III contains sample inspection guides to aid the maintenance officer in preparing for an inspection.

## Section II. MAINTENANCE STANDARDS

### 7–7. General

The organizational maintenance officer must insure that no faulty maintenance is performed by any member of the unit and

that any aircraft released is safe for flight. Faulty maintenance such as incomplete preflight inspections, improperly assembled parts, an oil change that is past due, or a minute unnoticed crack in the airframe may result in an aircraft accident.

## 7–8. Maintenance Abuses and Faulty Practices

Practices which result in faulty maintenance include—

*a.* Lack of adequate inspections and supervision.

*b.* Improper or negligent use of material and equipment.

*c.* Lack of lubrication, overlubrication, or use of improper lubricants.

*d.* Use of too much pressure when greasing rotor heads, thereby blowing out the seals.

*e.* Deferred maintenance.

*f.* Improper servicing and adjustment.

*g.* Repair by unqualified personnel.

*h.* Use of improper or inadequate tools and/or equipment.

*i.* Tinkering with an otherwise satisfactory assembly.

*j.* Oil dilution.

*k.* Continuous use of full throttle.

*l.* Taxying with brakes.

*m.* Rough treatment of delicate assemblies.

## 7–9. Factors Affecting the Army Maintenance System

To develop an efficient Army maintenance system, the commander must—

*a.* Have a thorough knowledge of preventative maintenance (PM). The principles of first echelon maintenance are covered in paragraph 1–3*c* and *d*.

*b.* Provide time for PM, PM training, and personal inspections.

*c.* Provide trained personnel to perform PM.

*d.* Motivate his personnel to do their work with precision and alactrity.

*e.* Keep a constant check on tool control, status of parts supply, and availability of current publications.

*f.* Provide adequate facilities for the performance of all phases of PM which fall within the responsibilities of his organization.

## 7–10. Prevention of Faulty Maintenance

Faulty maintenance can be prevented by proper supervision, training, high morale, and cleanliness.

*a. Supervision.* Adequate supervision is one of the best methods of preventing faulty maintenance. One supervisor for three to seven subordinates is recommended (par. 3–1*b*).

*b. Training.* Maintenance personnel must be continually trained because of changes and alterations in aircraft and components. A mechanic should *always* use a checklist, if available, for every maintenance function performed. Recent, pertinent publications also contain valuable information for maintenance personnel.

*c. Morale.* Personnel with high morale contribute to the efficiency of an organization. A mechanic who has pride in his work will make fewer errors.

*d. Cleanliness.* Cleanliness of the mechanic, his tools, and his work area contribute to the quality of maintenance. An efficient, well-trained mechanic keeps himself as clean and greasefree as possible. When a job is completed, his tools are cleaned, his work area is policed, and his aircraft is ready for inspection and flight.

# PART THREE
# MAINTENANCE SCHEDULING

# CHAPTER 8
# PUBLICATIONS AND PUBLICATIONS FILES

## Section I. GENERAL

### 8–1. Types of Publications

Technical information on Army aircraft operation, maintenance, and supply is found in technical manuals, technical bulletins, modification work orders, supply manuals, and supply bulletins. These publications are essential to the safe operation and efficient maintenance of aircraft. They provide specific information on tools and repair parts, allowances and operation, and maintenance or supply procedures for each type aircraft.

*Note.* DA PAM 310–4, an index of technical publications, be outlines those pertinent to Army aviation.

### 8–2. Publications on Supply

Supply information on aircraft is contained in the following types of publications:

*a. Technical Manuals.* Repair parts and special tool lists are listed in the dash 20 technical manual or in the applicable dash 20P of the TM 55-series when published separately from the maintenance instructions.

*b. Supply Manuals.*

(1) Type 1, such as the 55–1-series. Stock list of all items, except repair parts.
(2) Type 2, such as the 55–2-series. Stock list of all items, price list.
(3) Type 3, such as the 55–3-series. Cross-reference lists.
(4) Type 4, such as the 55–4-series. Stock list of components of sets, kits, and outfits.
(5) Type 5, such as the 55–5-series. Stock list of current issue items.

*c. Supply Bulletins.* Information on the more technical aspects of supply matters, such as compilation of logistical data, is contained in the SB 1–15-series.

### 8–3. Supply of Publications

Administrative, maintenance, supply, and technical publications are procured, stocked, and issued through Adjutant General publication supply channels (AR 310–1).

### 8–4. Publications Issued to Individuals

Unclassified publications, unless restricted to fixed files, may be assigned to individuals as required. These copies must be maintained in current status and are subject to the same inspections as the files. Work copies of technical manuals may be required by personnel working on authorized projects. Other types of publications authorized for assignment to individuals are—

*a.* Technical manuals (dash 10 of the TM 55-series) on aircraft operator's manuals.

*b.* Technical manuals (dash 20 of the TM 55-series) on aircraft organizational maintenance.

*c.* Numerical and alphabetical indexes in DA Pam 310–4 and 310–22.

## Section II. TECHNICAL PUBLICATIONS FOR ORGANIZATIONAL MAINTENANCE

### 8–5. Use and Location

Technical manual files will be accessible to all personnel responsible for maintenance, operation, storage, issue, and inspection. The unit commander will encourage full use of these publications.

### 8–6. Currency of Files

Files will be checked against DA Pam 310–4 and 310–22 to insure that they are up to date. After a file is initially established, its current status will be checked against each applicable new numerical index, revision, or supplement received. Each active file will be checked annually against the appropriate numerical index to determine any deficiencies or excesses in the file.

### 8–7. Inspection of TM Files

Technical publication files will be inspected to insure that—

*a.* All publications required by using personnel are available.

*b.* Files are conveniently located to users.

*c.* Unncessary publications are not in the file.

## 8–8. Disposition of Publications

Publications may be disposed of when they have been rescinded, replaced, or superseded, or when they are no longer needed.

*a.* Unclassified publications will be disposed of according to instructions from the local salvage officer.

*b.* Rescinded classified publications will be destroyed according to AR 380–5.

## 8–9. Procurement

*a. Initial Distribution.* DA Form 12 (Requisition for Initial Distribution of Publications and Blank Forms) and DA Form 12–5 (Publications Furnished in Quantity Determined by Using Agency, Part IV—Army Aircraft Publications) are provided so that requisitions may be made in advance from Adjutant General publications centers for new and revised publications, and changes to publications which are applicable to the aircraft supported. These forms should be submitted whenever new aircraft are to be supported or when requirements for publications change.

*b. Replenishment.* Requisitions for required publications listed in DA Pam 310–4 and 310–22 will be prepared on DA Form 17 (Requisition for Publications and Blank Forms) and submitted through publications channels.

## 8–10. Appendixes

An appendix is an addition to a publication and may include tables, charts, and supplementary information. It is an integral part of the publication, though not a part of the normal sequence of discussion. An appendix may be a part of the basic publication (e.g., an appendix of flight operating charts in a flight manual), or it may be issued separately to include additional information in an existing publication. Each separate appendix received will be filed at the end of the basic publication, which will be posted to show the addition (par. 8.13*b*).

## 8–11. Changes

Department of the Army technical publications are maintained in current status by the publication of numbered changes or revisions. The first change issued is numbered *C 1*, the second *C 2*, etc., and later changes may supersede previous ones. As these changes become available, they are listed by change number, under the basic publication number and title, in the appropriate numerical index.

## Section III. TECHNICAL MANUAL FILE

### 8–12. Old System
Rescinded

### 8–13. Five Part Manual System

The multiple part manual system, developed to support the five echelons of Army maintenance, replaces the TM 1-series for Army aircraft. The multiple part manual system includes an entire family of publications and will combine the principles of the old system with pertinent information on maintenance and operation of each type Army aircraft according to the echelons of maintenance involved. This manual system will include three different TM repair parts manuals: –20P, –34P, and –50P of the TM 55-series. TM –20P will be published separately for part II (dash 20), and will contain supply data only for those items which have been authorized for second echelon (organizational) maintenance support of aircraft. TM –34P will be published separately for parts III and IV (dash 34), and will contain supply data for third and fourth echelon (field) maintenance support of aircraft. TM –50P will contain supply data pertinent to all items necessary for maintenance support of the aircraft, and will be published separately for part V (dash 50). Each manual is divided into chapters.

*a. Part I (dash 10), Operator's Manual.* This manual will pertain solely to the operation of the aircraft and will contain the following information:

(1) Description of all systems and controls which contribute to the physical act of the aircraft.
(2) Normal and emergency flight procedures.
(3) Auxiliary and electronic equipment.
(4) Operating limitations and flight characteristics.
(5) Weather operations.
(6) Crew duties.
(7) Weight and balance computation.
(8) Aircraft loading.
(9) Performance data.

*b. Part II (dash 20), Organizational Maintenance Instructions.* This manual will provide all of the essential information for maintenance personnel to accomplish first and second echelon organizational maintenance on the complete airframe, components, systems, and assemblies. This manual will also contain—

(1) Inspection requirements for all types of regular and periodic test inspections. Lubrications orders will also be included.

(2) Storage procedures for aircraft.

(3) Appendixes as follows:

(*a*) Maintenance allocation charts. These will be published as part of the basic manual.

(*b*) Repair parts and special tool lists. These will be published separately and will be identified as –20P.

(*c*) Weight and balance data. These will be published separately.

*c. Parts III and IV (dash 34), Field Maintenance Instructions.* This manual will contain all information pertinent to the third and fourth echelons of maintenance not included in parts I and II, and a list of repair parts authorized for initial stockage for use in third and fourth echelon maintenance, and supply support to second echelon. TM –34 may be arranged in as many chapters as necessary.

*d. Part V (dash 50), Depot Maintenance Manual.* This manual will contain information pertinent to depot maintenance, repair parts authorized for depot maintenance, and initial stockage for maintenance and supply support to lower echelons. TM –50 may be arranged in as many chapters as necessary.

### 8–14. Other Manuals

*a.* A technical manual (Army) is issued for each piece of associated aircraft equipment.

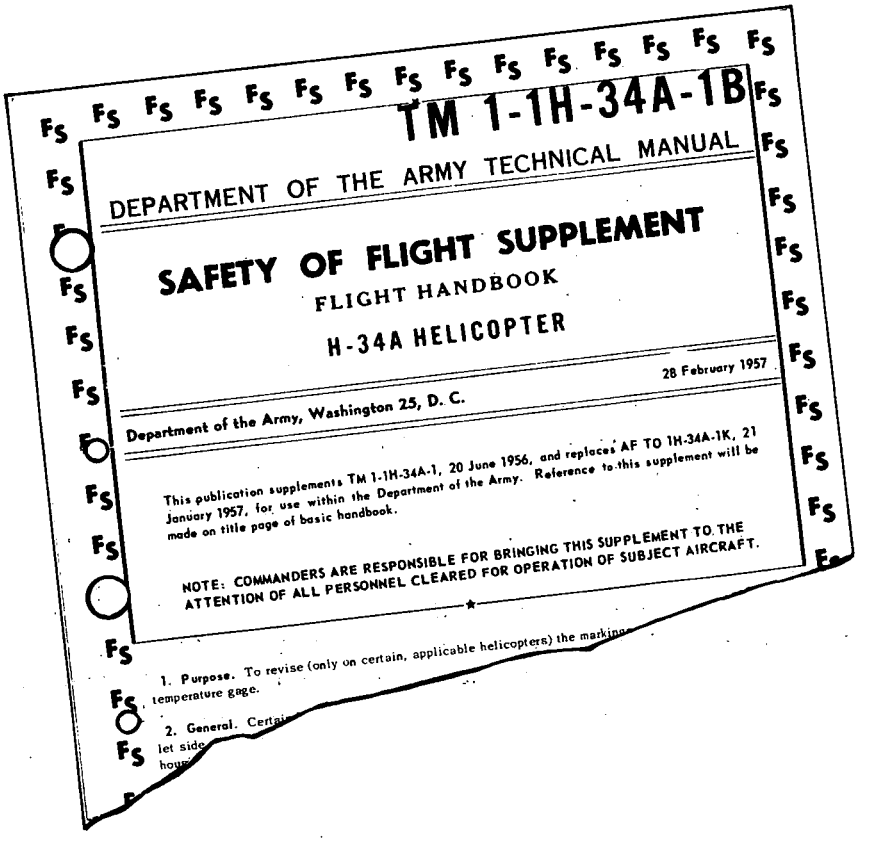
*b.* Manuals of instructions for aircraft engines or accessories include service instructions, overhaul instructions, modification work orders, and parts breakdown.

*c.* Indexes are issued to provide information on the availability and status of all authorized technical manuals.

## Section IV. SUPPLEMENTARY TYPE PUBLICATIONS

### 8–15. Safety of Flight Supplements

*a. General.* Safety of Flight Supplements (fig. 8–1) are issued to give prompt safety of flight information. They contain important informational, operational, precautionary, and restrictive instructions that affect safety of flight but do not require grounding of the aircraft. When safety of flight information is applicable to more than one type of aircraft, separate supplements are issued for each type of aircraft involved.


TM 1-1H-34A-1B

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

SAFETY OF FLIGHT SUPPLEMENT

FLIGHT HANDBOOK

H-34A HELICOPTER

Department of the Army, Washington 25, D. C. 28 February 1957

This publication supplements TM 1-1H-34A-1, 20 June 1956, and replaces AF TO 1H-34A-1K, 21 January 1957, for use within the Department of the Army. Reference to this supplement will be made on title page of basic handbook.

NOTE: COMMANDERS ARE RESPONSIBLE FOR BRINGING THIS SUPPLEMENT TO THE ATTENTION OF ALL PERSONNEL CLEARED FOR OPERATION OF SUBJECT AIRCRAFT.

1. Purpose. To revise (only on certain, applicable helicopters) the marking
temperature gage.

2. General. Certa
let side
hou

*Figure 8–1. Safety of Flight Supplement.*

*Note.* Safety of Flight Supplements must be issued for review and study to each individual concerned.

*b. Types.* These supplements are issued in two forms—*interim* and *formal.* Interim supplements are issued by teletype message when loss of life or serious injury to personnel may be involved. Formal supplements are printed and distributed through normal channels when serious damage to the aircraft is involved, or to replace interim supplements.

*c. Description.* Safety of Flight Supplements are designed to be readily identified by pilots and other flight crew members. The first page of formal supplements has a complete border of red *FS*'s with these words in red: "SAFETY OF FLIGHT SUPPLEMENT FLIGHT HANDBOOK" at the top of the page, and "SAFETY OF FLIGHT" at the bottom of the page. Both the interim and the formal supplement bear this directive: "Commanders are re-

sponsible for bringing this supplement to the attention of all personnel cleared for operation of subject aircraft."

*d. Filing.*

(1) Supplements are filed in numerical and/or alphabetical order immediately following the basic publication.

(2) They remain active until rescinded or included in the basic publication by revision or reissue.

(3) They are maintained in all files where the basic publications are required, including aircraft files, aircraft emergency operating instruction files in control towers, operations office files, and flight crew information files.

### 8–16. Other Supplements

*a. Flight Range Guides.* Flight range guides provide compact flight control data for pilots of jet aircraft.

*b. Aircraft Inspection Workcards.* Aircraft inspection workcards are issued in separate sets for each type of inspection and are used as a guide by mechanics and specialists while performing inspections.

*c. Commercial Technical Publications.* Commercial technical publications are normally furnished by manufacturers to purchasers and contain technical information on assembly, installation, operation, servicing, overhaul, and parts identification of specified equipment.

## Section V. TIME COMPLIANCE PUBLICATIONS

### 8–17. General

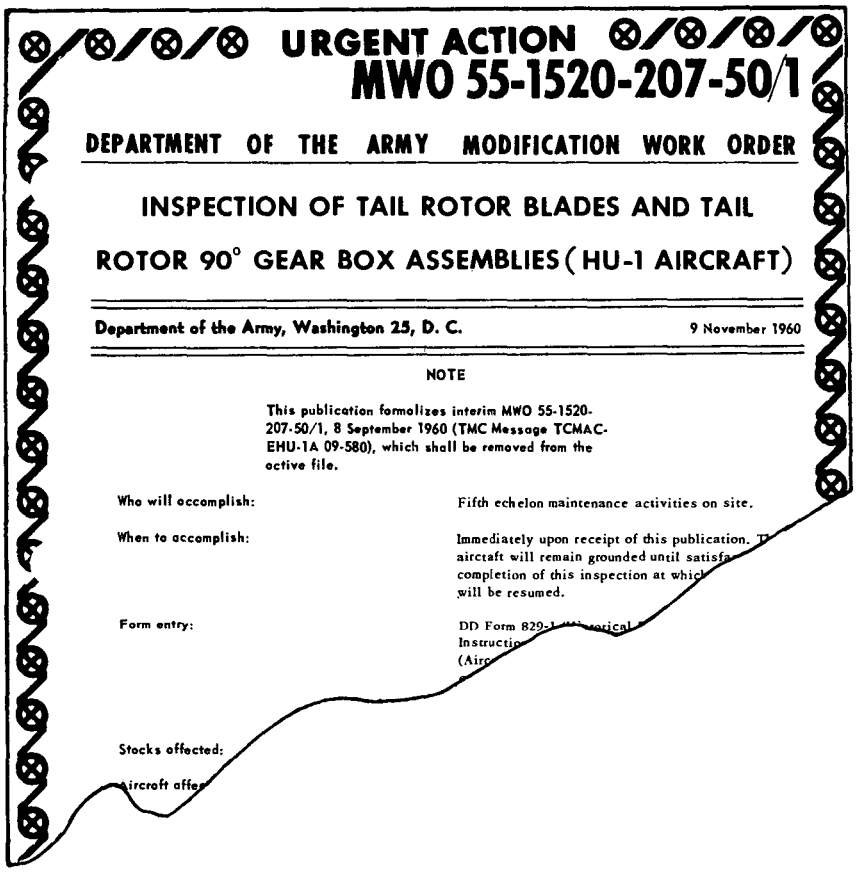
Modification Work Orders (MWO's) require compliance within specified time limits and are grouped according to the importance and urgency of the instructions they contain. They furnish supplementary instructions and operating procedures and are the only authorized media to provide modification instructions for aircraft and equipment (AR 750–712). Commanders will insure that operating personnel become familiar with the contents of these publications. The two types of MWO's are *Urgent Action* and *Normal Action.*

### 8–18. Immediate Action Rescinded

*Figure 8–2.* Rescinded.

### 8–19. Urgent Action

*a.* Urgent Action MWO's (fig. 8.3) are issued to correct dangerous or potentially hazardous conditions which could result in



URGENT ACTION

MWO 55-1520-207-50/1

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSPECTION OF TAIL ROTOR BLADES AND TAIL ROTOR 90° GEAR BOX ASSEMBLIES (HU-1 AIRCRAFT)

Department of the Army, Washington 25, D. C. 9 November 1960

NOTE

This publication formolizes interim MWO 55-1520-207-50/1, 8 September 1960 (TMC Message TCMAC-EHU-1A 09-580), which shall be removed from the active file.

Who will accomplish: Fifth echelon maintenance activities on site.

When to accomplish: Immediately upon receipt of this publication. T aircraft will remain grounded until satisfa completion of this inspection at whic will be resumed.

Form entry: DD Form 829-1 [illegible]erical Instructio (Airc

Stocks affected:

Aircraft affe

*Figure 8–3.* (Superseded) *Urgent action MWO's.*

injury to personnel, damage to property, or unacceptable reduction in combat efficiency. Such risks are calculated to be tolerable only within definite time limits (*b* below).

*b.* These MWO's either ground the aircraft immediately or specify that the work is to be completed within dates specified on the MWO, usually not to exceed 10 days after receipt of the MWO. The first page is bordered in distinctive red symbols with URGENT ACTION printed at the top of the page.

*c.* Immediately upon receipt of an Urgent Action MWO, appropriate entry is made on the applicable Historical Record and entered in the appropriate blocks of the DA Form 2391-series. Exceptional release of the aircraft for flight or for use of its equipment is mandatory until compliance is accomplished or the time limit expires.

*d.* If compliance is not accomplished within the time limit specified, the aircraft is grounded or nonaeronautical and personnel equipment usage is discontinued.

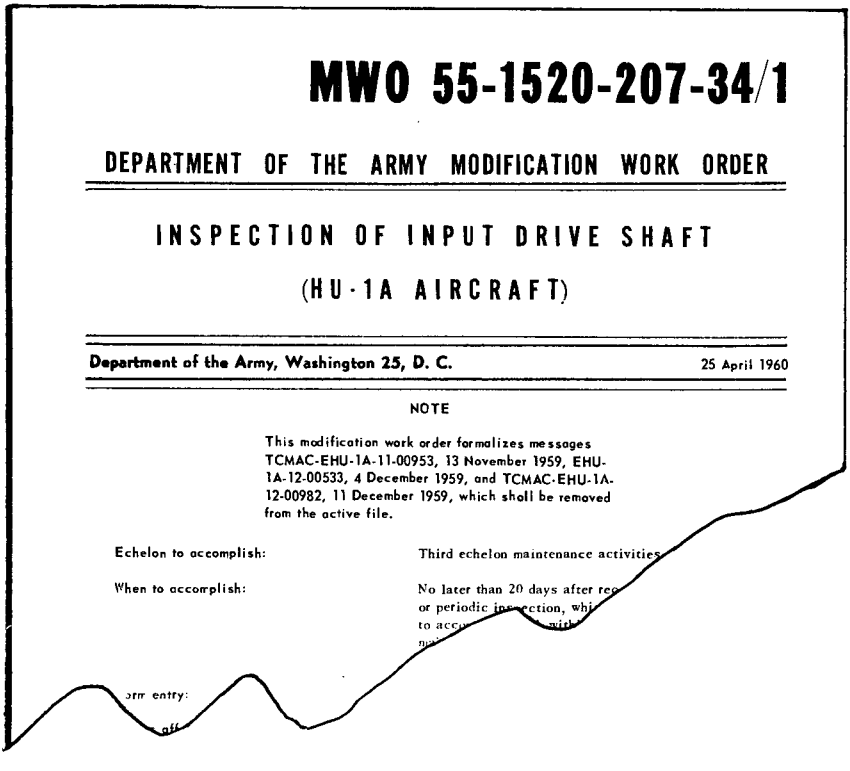
## 8–20. Normal Action

*a.* Normal Action MWO's (fig. 8.4) are issued when procedural discrepancies are found which would prove hazardous through prolonged, continuous use. These discrepancies may be of a material, mechanical, operational, or tactical type; they involve risks which are considered tolerable within broad limits. In addition to being hazardous, discrepancies of this type may reduce—

(1) Operational efficiency.

(2) Operational life or general service utilization.

(3) Tactical or tactical support usefulness.



**MWO 55-1520-207-34/1**

**DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER**

**INSPECTION OF INPUT DRIVE SHAFT**

**(HU-1A AIRCRAFT)**

**Department of the Army, Washington 25, D. C.** 25 April 1960

NOTE

This modification work order formalizes messages TCMAC-EHU-1A-11-00953, 13 November 1959, EHU-1A-12-00533, 4 December 1959, and TCMAC-EHU-1A-12-00982, 11 December 1959, which shall be removed from the active file.

Echelon to accomplish: Third echelon maintenance activities

When to accomplish: No later than 20 days after re
or periodic ins ection, whi
to acc
n

orm entry:

aft

*Figure 8–4. Normal action MWO's.*

*b.* Normal Action MWO's are issued in two categories based on primary responsibility for accomplishment. They are printed on plain white paper without distinguishing symbols and are issued without recission dates.

(1) MWO's in category 1 require compliance by organizational or field maintenance units, with depot or contractor assistance when appropriate. Work should be completed within 90 days after receipt of the modification kit or, if no kit is required, within 90 days after receipt of the publication. No symbol is entered on DA Form 2391–2 or on DA Form 2391–3 (Aircraft Flight Report and Maintenance Record-Delayed Correction Discrepancy List) until expiration of the specified time limit. When the time limit has expired, a red diagonal (/) is entered in the appropriate blocks and an exceptional release is required pending MWO compliance.

(2) MWO's in category 2 specify that work will be accomplished during depot-level maintenance activities (IROAN or overhaul). No symbol entries are required on maintenance forms.

# CHAPTER 9
# FORMS, RECORDS, AND CHARTS

## Section I. MAJOR AIRCRAFT FORMS

### 9–1. General

The forms used most frequently in the aircraft inspection system are the Aircraft Inventory Record, the Aircraft Flight Report and Maintenance Record, and the Historical Record. AR 700–1500–2 and TB AVN 5 describe the forms and the method of applying the symbols.

### 9–2. Aircraft Inventory Records (DD Form 780-Series)

The Aircraft Inventory Record, which replaces the Aircraft Checkers Report, standardizes present inventory procedures. The forms which compose this record may be employed as a guide by using organizations when inventorying items of installed and/or loose equipment. AR 700–1500–2 contains detailed information on the preparation and maintenance of DD Form 780–1. A master inventory record consisting of four basic parts is prepared for each aircraft.

*a.* The *Aircraft Inventory Record* (*DD Form 780*) provides general identification of aircraft and a sectional breakdown diagram showing specific stations and compartments where inventoriable items are contained.

*b.* The *Aircraft Inventory Record—Equipment List* (*DD Form 780–1*) is an inventory record list of quantity, nomenclature, location, and equipment checks of installed items.

*c.* The *Aircraft Inventory Record—Shortages (DD Form 780–2)* is a record list of quantity, nomenclature, and authority or reason for shortage of inventoriable items.

*d.* The *Aircraft Inventory Record—Certification and Record of Transfers* (*DD Form 780–3*) provides space to indicate compliance with the inventory of property installed in the aircraft and acceptance of responsibility of this property.

### 9–3. Aircraft Flight Report and Maintenance Records (DA Form 2391-Series)

The *Aircraft Flight Report and Maintenance Record* (*DA Form*

*2391*) contains a complete record of the flights, maintenance, and inspections of the aircraft (TB AVN 5). It lists and explains the symbols to be used by the pilot when completing the DA Form 2391–1. It serves as a cover sheet for the series of forms below.

*a.* The *Aircraft Flight Report and Maintenance Record—Aircraft Flight Report* (*DA Form 2391–1*) is used for recording the flying time and mission of a particular flight or flights by one or more individuals during 1 day of operation.

*b.* The *Aircraft Flight Report and Maintenance Record—Aircraft Inspection and Maintenance* (*DA Form 2391–2*) lists all maintenance, servicing, and inspections performed on the aircraft, and indicates the status of the aircraft. Some entries are made by the pilot, some by maintenance personnel.

*c.* The *Aircraft Flight Report and Maintenance Record—Delayed Correction Discrepancy List* (*DA Form 2391–3*) itemizes discrepancies which will have delayed corrective action and the reasons for the delay. This form provides the maintenance crew with a written list of delayed discrepancies and accessories overdue for replacement which have been transferred from DA Form 2391–2 to preclude having to carry these items forward each day to the new DA Form 2391–2. Defects symbolized by a red X or a circled red X will never be entered on the discrepancy list; a red dash entry will be made only to show accessories due for replacement. Until this accessory is replaced, a red dash will be placed on DA Form 2391–2 along with this statement: "Accessory overdue for replacement. See Delayed Correction Discrepancy list."

*d.* The *Aircraft Flight Report and Maintenance Record—Aircraft General Data* (*DA Form 2391–4*) provides blocks for entries on fuel capacity, oil capacity, and engine data. These entries are not required, but may be made at the discretion of the local maintenance officer. Items which are to be inspected at intervals of calendar time must be entered in the calendar inspection schedule; those which are inspected at specified periodic intervals are *not* entered.

*e.* The *Aircraft Flight Report and Maintenance Record—Accessories Data* (*DA Form 2391–5*) contains space for a current record of accessories or items to be replaced after a specified number of operating hours or a calendar period.

*f.* The *Aircraft Flight Report and Maintenance Record—Aircraft Summary* (*DA Form 2391–6*) provides space to record the time and date the aircraft was flown, with the number and type

of landings performed. The "Total Time" column may be used for oil consumption data.

## 9–4. Historical Records (DD Form 829-Series)

Historical records will be maintained in accordance with TB AVN 5, Aircraft Inspection System; and TB AVN 23–5-series, Unsatisfactory Report Digest.

*a.* The *Historical Record for Aeronautical Equipment* (*DD Form 829*) provides a history of the aircraft and related components, including information on shipping and receiving (whether the aircraft or component is new, reconditioned, or overhauled), operating hours, rounds fired (for guns), associated equipment installed, length of time equipment remained installed, and pertinent remarks.

(1) Data will be entered in blocks provided for page number, nomenclature of item of equipment for which the form is prepared, serial number, and acceptance date. When an aircraft or equipment is transferred to or from an organization, an entry will be made in each column of the section on "Record of Transfer." The transferring organization will suffix its entry in the Record of Transfer column with the letter "S" (shipped); the receiving organization will suffix its entry in the Record of Transfer column with "R" (received). The responsible officer will sign in the "Inspected" column. For guns, the hours or rounds fired since new or overhauled will be entered in the appropriate column if known; if unknown, the word "Unknown" will be entered.

(2) The "Installation Record" block provides space for a complete installation record of equipment on type of aircraft, location, installation and removal time. A record of associated equipment will be maintained on those items returned to overhaul or transferred with basic component for which a record of operating time is required in TM –6-series.

*b.* The *Historical Record—Technical Instruction Compliance* (*DD Form 829–1*) provides a record of technical instruction compliances for each aircraft and piece of equipment involved.

*c.* The *Historical Record—Significant Historical Data* (*DD Form 829–2*) provides additional space for the continuation of entries.

## Section II. MISCELLANEOUS FORMS AND RECORDS

### 9–5. Cylinder Compression Check

Inspection requirements specify that a cylinder compression check will be performed on an aircraft engine after a stated number of hours. This should be accomplished during the periodic inspection (PE) which comes nearest the completion of these hours. If necessary, cylinder compression checks may be made at intervening times. Pertinent data relating to the compression check will be recorded on DD Form 829–2.

### 9–5.1. Armament Record

The historical recording, by weapon type, of number of rounds fired and/or the number of rockets or missiles launched is required for proper determination and evaluation of the critical failure points of airframe equipment and structures which support installed armament systems. TB AVN 23-series contains specific instructions for historical recording. Briefly, the recording instructions are—

*a.* Appropriate daily entries will be made in block 26, DA Form 2391–2, indicating by weapon type the number of rounds fired and/or the number of rockets or missiles launched.

*b.* The above data will be consolidated monthly by weapon type and number of rounds, rockets, and missiles fired or launched, and transcribed to the applicable airframe Historical Record, DD Form 829, block 8. DD Form 829–2 will be utilized, when required, as a continuation of block 8 of the DD Form 829.

### 9–6. Work Request and Job Order (DA Form 811)

When necessary to send an aircraft or component to field maintenance for inspection and repair, a work request and job order (DA Form 811 (fig. 9–1)), will be initiated, and all work requested will be itemized.

*a.* Organizational maintenance officers must notify the field maintenance activity as far in advance as possible of their field maintenance requirements.

*b.* Organizational maintenance discrepancies must be corrected prior to delivery of the aircraft to the field maintenance activity.

### 9–7. Preparation for Evacuation to Field Maintenance

*a.* To prepare an aircraft for evacuation to field maintenance, this procedure should be followed:

(1) Thoroughly clean aircraft and engine.

(2) Complete all possible organizational maintenance.

(3) If feasible under operating conditions, remove loose equipment such as parachutes, ashtrays, and extra seats.

(4) Prior to preparation of DA Form 811, inspect aircraft records to insure that they are accurate and complete.

*b.* When the aircraft is delivered to the field maintenance activity, this procedure should be followed:

(1) DA Form 811 and the aircraft records should be turned in to the field maintenance officer or his authorized representative, who will sign and return the fourth copy to the representative of the using unit.

(2) A list of all loose equipment and aircraft records should be prepared in duplicate, signed by both parties, and the duplicate returned to the using unit's representative.

## 9–8. Return From Field Maintenance

When the using unit is notified that the aircraft is ready for

DATE: 12 Aug 60 | ORGANIZATION: Using Unit | REFERENCE NUMBER: Using Unit File #

ACCOUNT CODE NUMBER | PRIORITY | JOB ORDER NUMBER

TECHNICAL SERVICE ITEM | ORD | OMC | SIG | ENGR | TRANS: X | CML | MED

ITEM IDENTIFICATION

DESCRIPTION OF WORK TO BE PERFORMED

Inspect and repair as necessary 1 ea. set
Main Rotor Blades for the following acft.

H-13G 52-7878

AUTHORIZED BY (Signature): [illegible], Capt Arty, Maintenance Officer

RECEIVED BY (Signature): L. L. Bauer

FILL IN ABOVE AS WORK REQUEST

ROUTING AND FLOW

| ASSIGN TO | DATE IN | SIGN | DATE OUT | SIGN | FINAL INSPECTION |
|---|---|---|---|---|---|
| A - AUTOMOTIVE | | | | | |
| I - ARMT & INSTRUMENT | | | | | |
| C - CLOTHING & EQUIPMENT | | | | | |
| E - ELECTRIC | | | | | |
| M - MACHINE | | | | | |
| P - PAINT | | | | | |
| G - GN AND FIRE CONTROL | | | | | |
| | | | | | |
| | | | | | |
| TO HIGHER ECHELON FOR REPAIR AND RECLAMATION | | | | | |

| COMPLETION DATA | DATE RECEIVED | ORGN OR WAREHOUSE | RECEIVED BY |
|---|---|---|---|
| SALVAGE | | | |
| ORGANIZATION | | | |
| WAREHOUSE | | | |

SHIPPING INSTRUCTIONS FOR EVACUATING EQUIPMENT: SHIPPED TO | ADDRESS

INSTRUCTIONS FOR WORK TO BE PERFORMED

| QUANTITY | PARTS NUMBER | WORK TO BE PERFORMED OR NOMENCLATURE |
|---|---|---|
| | | |

SIGNATURE OF INSPECTOR

CONTROL OFFICE DATA

| DATE RECEIVED | ESTIMATED MAN-HOURS | TOTAL MAN-HOURS | FILE DATE |
|---|---|---|---|
| | | | |
| TOTAL LABOR COST | TOTAL MATERIAL COST | TOTAL JOB COST | COMPLETION DATE |
| | | | |

DA FORM 1 DEC 58 811 — PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE — WORK REQUEST AND JOB ORDER (FM 9-10) — 1

*Figure 9–1. DA Form 811, Work Request and Job Order.*

issue, the representative of the using unit should follow this procedure:

*a.* Present the receipt copy of DA Form 811 at the field maintenance office.

*b.* Perform a check of loose equipment, using the loose-equipment checklist previously prepared (par. 9–7*b*(2)).

*c.* Check aircraft records for accuracy and required entries.

*d.* Check the aircraft thoroughly (test fly if necessary) to determine if the requested maintenance work has been performed satisfactorily.

*e.* Bring any unsatisfactory condition to the attention of the responsible field maintenance officer.

## 9–9. Replacements

*a.* If an accessory replacement which is ordinarily an organizational maintenance responsibility is due when the aircraft is in field maintenance for inspection, the replacement becomes the responsibility of the field maintenance activity. The field maintenance activity will be notified of this responsibility at the scheduled inspection prior to the one on which this replacement is due.

*b.* Accessories authorized to be replaced by organizational maintenance in the maintenance allocation charts must be ordered far enough in advance to be available when the aircraft is down for scheduled maintenance.

*c.* Scheduled accessory replacements (engines, helicopter gear boxes, etc.) which are beyond the scope of organizational maintenance are the responsibility of the field maintenance activity and generally will be made during scheduled inspections. The field maintenance activity will be notified at the scheduled inspection prior to the one at which the replacement is to be made.

*Note.* The using organization will furnish maintenance personnel as required by the field maintenance activity to accomplish organizational maintenance.

## 9–10. DD Form 1275, Unsatisfactory Report (UR)

*a.* For complete information on UR's for Transportation Corps air items, see AR 700–41.

*b.* Reports on air items of other technical services will be prepared on DA Form 468 (Unsatisfactory Equipment Report) in accordance with AR 700–38. Unsatisfactory conditions on Army Transportation Corps air items will be reported on DD Form 1275 (Unsatisfactory Report) in accordance with AR 700–41 as shown in figure 9–2. This is the only means of notifying the U. S. Army

Transportation Materiel Command (TMC) of unsatisfactory conditions. Even the remotest possibility that the condition may affect safety of flight should be considered as an emergency and the UR transmitted by the most expeditious means. Conditions to be reported include—

(1) Failure or malfunction of Army Transportation Corps air items, equipment, or material prior to the prescribed overhaul or replacement time.
(2) Unsatisfactory design of equipment or material.
(3) Defects due to faulty material, workmanship, or quality inspection.
(4) Deterioration of equipment or material due to climatic or environmental conditions.
(5) Defects due to improper installation or maintenance.
(6) Delayed receipt of publications.
(7) Instances when personnel are exposed to unhealthy conditions.
(8) Unsatisfactory handling characteristics or operational deficiencies.

*Note.* TB AVN 23–5-series, Unsatisfactory Report Digest, is issued once a month and is required reading for every organizational maintenance officer.

## 9–11. DA Form 1352, Army Aircraft Inventory, Status, and Flying Time

*a.* The status of aircraft will be reported monthly by the organization having accountability on the last day of the month. This report will be submitted on DA Form 1352 (fig. 9–3) in the number of copies specified by the jurisdictional army area or oversea command. It must reach the appropriate command headquarters on the second working day of the month following the reported month. See AR 710–1500–8 for complete instructions on the preparation and submission of this report.

*b.* Organizations losing Army aircraft through transfer are responsible for transferring statistical data to the gaining organization for that portion of the month the aircraft was on its accountable records. DA Form 1352 will be completed for each aircraft and transferred with the aircraft records. An information copy will be forwarded to the appropriate headquarters. Aircraft on loan will be reported by the organization having accountability: "unknown" will *not* be used; if accurate data cannot be obtained, an estimate will be made, based on past experience.

**UNSATISFACTORY REPORT** — REPORT CONTROL SYMBOL TC-208

| 1. ACTION AGENCY | | 2. CATEGORY (Indicate 1 Emergency, 2 Urgent or 3 Routine) | | | | |
|---|---|---|---|---|---|---|
| SERIAL NO. | PROJECT NO. | 3 | REPORTING ACTIVITY | | MAJOR COMMAND | ACTION AGENCY |

| 3. REPORTING ACTIVITY | | | |
|---|---|---|---|
| UR SERIAL NO. | DATE | ORGANIZATION | STATION |

| 4. IDENTIFICATION | | 5. SUPPLEMENTARY DATA | |
|---|---|---|---|
| ITEM | Wheel Subassembly | QUANTITY IN USE | 10 |
| PROPERTY CLASS | 1630 | QUANTITY IN STOCK | 0 |
| SERIAL NO. | N/A | QUANTITY INSPECTED 10 | QUANTITY DEFECTIVE 1 |
| STOCK OR PART NO. | 1630-604-0108 | NO. PREVOIUS FAILURES | 2 |
| PRIME CONTRACTOR | Goodyear Tire and Rubber Co. | LAST RECONDITIONING ACTIVITY | SAAMA |
| MANUFACTURER | Goodyear Tire and Rubber Co. | 6. USAGE (Hours - Miles - Operations) | |
| ORDER OR SHIPMENT NO. | N/A | SINCE NEW | UNK |
| PARTS CATALOG TO/TM | 1-1L-19A-4-20P | SINCE RECONDITION | 152:30 |
| FIGURE AND INDEX NO. | 46/6 | SUGGESTION NO. | N/A |

7. INSTALLED ON (Indicate major components and end item on which defective item installed or applicable to)

| NAME | TYPE, MODEL AND SERIES | SERIAL NO. |
|---|---|---|
| Wheel, Landing Gear | N/A | N/A |
| Landing Gear | N/A | N/A |
| Aircraft | L-19A | 51-12521 |

8. EXHIBIT DISPOSITION AND INCLOSURES (Place X in proper blocks)

| ATTACHED | | SENT UNDER SEPARATE COVER | | X | HELD FOR DISPOSITION INSTRUCTIONS | | REPAIRED OR RETURNED TO SERVICE | | TO OVERHAUL FACILITY INDICATE BELOW | | DISPOSED OF (Explain below) | X | INCLOSURES (Indicate below) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

9. DETAILS (1. Circumstances prior to difficulty. 2. Description of difficulty. 3. Cause. 4. Action taken. 5. Recommendations) (Continue on reverse.)

1. No prior difficulty.

2. Cracking of wheel subassembly FSN 1630-604-0108. While conducting a preflight inspection it was noted that three of the disc keys were loose. The wheel was removed and by the use of the dye penetrant inspection method, it was discovered that the wheel was cracked at two of the disc key slots. The cracks started at the inner flange of the wheel and protruded to the disc key retaining screw hole.

3. Loosening of key FSN 5315-598-8419.

4. The defective item was removed and replaced with a like serviceable item: Exhibit tagged with form 50K and turned in to the TC Avn Prop Off, pending receipt of disposition instructions. Two photographs inclosed.

5. Recommend that an investigation be conducted to determine the cause to prevent future failures.

JOHN J. JONES
Capt Arty
Maint Off
501st Avn Co, Fort Polk, Louisiana

DD FORM AUG 58 1275

*Figure 9–2. DD Form 1275, Unsatisfactory Report.*

## 9–12. DA Form 1890, Installed and Spare Aircraft Engines

*a.* A monthly report on installed and spare aircraft engines will be prepared by all active Army organizations, Reserve units, and National Guard units which possess Army aircraft or aircraft engines. It will be prepared on the last day of each month, submitted on DA Form 1890 (fig. 9–4), and forwarded not later than the 10th working day of the following month. Active Army and Reserve units will forward the complete report, in duplicate,

**ARMY AIRCRAFT INVENTORY, STATUS, AND FLYING TIME**
*(AR 710-1500-8)*

MONTH ENDING: 31 Aug 1959 | PAGE NO.: 1 | NO. OF PAGES: 5 | REPORTS CONTROL SYMBOL: TC-153(R1)

ORGANIZATION: Department of Maintenance | ACT. CLASS (ZI only): 1 | AIRCRAFT AUTH: TA 60-4 with Changes | DO NOT WRITE IN THIS SPACE

POST CAMP OR STATION: Fort Rucker, Ala | INST. CLASS: 1 | STATION

COMMAND: Third Army | UNIT | COMMAND

| AIRPLANES | | | | HELICOPTERS | | |
|---|---|---|---|---|---|---|
| OBSERVATION | UTILITY | COMMAND | CARGO | RECONNAISSANCE | UTILITY | CARGO |
| 154 | 82 | 5 | 7 | 102 | 33 | 86 |

| TYPE MODEL SERIES (a) | SERIAL NUMBER (b) | ASSIGNMENT CODE (c) | NUMBER OF DAYS ON HAND DURING MONTH: TOTAL (d) | IN COMMISSION (e) | OUT OF COMMISSION: TOTAL (f) | ACCP (g) | DEPOT MAINT. (h) | FIELD MAINT. (i) | ORG. MAINT. (j) | OTHER (k) | HOURS FLOWN DURING MONTH (l) | GAINED OR LOST (m) | REMARKS (n) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L-19A | 51-11916 | A | 31 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | GT | USA AVN CEN, Ft Rucker, Ala |
| L-19A | 50-1518 | Z | 31 | 0 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | | |
| L-19E | 56-2474 | A | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | | Turned into salvage |
| TL-19D | 55-4514 | A | 31 | 27 | 4 | 0 | 0 | 0 | 4 | 0 | 85 | | |
| L-20A | 53-3734 | A | 31 | 26 | 5 | 0 | 0 | 0 | 5 | 0 | 23 | | |
| L-23A | 52-6209 | A | 31 | 0 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | | Maint ground school |
| U-1A | 55-3288 | A | 31 | 15 | 16 | 10 | 0 | 0 | 6 | 0 | 0 | | Maint ground school |
| H-13D | 51-2459 | Z | 31 | 0 | 31 | 0 | 0 | 0 | 2 | 29(C) | 0 | | |
| H-13E | 51-14065 | A | 31 | 21 | 10 | 0 | 0 | 5 | 5 | 0 | 4 | | |
| H-13G | 52-7904 | A | 3 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | LT | USA AVN CEN, Ft Rucker, Ala 3 Aug 58 |
| H-13G | 52-7904 | A | 31 | 22 | 9 | 0 | 4 | 0 | 5 | 0 | * | | *All records with a/c at SCAMP |
| H-19D | 56-1542 | A | 31 | 0 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | GT | USA AVN CEN, Ft Rucker, Ala 20 Aug 58 |
| H-21C | 55-4214 | A | 31 | 21 | 10 | 0 | 0 | 0 | 10 | 0 | 17 | GT | USA AVN CEN, Ft Rucker, Ala 21 Aug 58 |
| H-23C | 55-4081 | A | 31 | 29 | 2 | 0 | 0 | 0 | 2 | 0 | 6 | | |
| H-34A | 53-4526 | Z | 31 | 0 | 31 | 0 | 0 | 0 | 3 | 28(C) | 0 | | |
| H-37A | 54-996 | A | 31 | 20 | 11 | 0 | 0 | 11 | 0 | 0 | 2 | | |

TYPED OR PRINTED NAME, GRADE AND BRANCH OF AUTHENTICATING OFFICER: JOHN J. JONES, Capt Arty

SIGNATURE: John J. Jones

DA FORM 1 SEP 56 1352 REPLACES EDITION OF 1 MAY 55, WHICH IS OBSOLETE

U. S. GOVERNMENT PRINTING OFFICE 1956 O—399778

*Figure 9–3. DA Form 1352, Army Aircraft Inventory, Status, and Flying Time.*

**INSTALLED AND SPARE AIRCRAFT ENGINES** (AR 700-2800-2)

FOR STATISTICAL SERVICE USE

PERIOD ENDING: 31 Aug 60

REPORTS CONTROL SYMBOL: TC-174

TO: Transportation Materiel Command, St. Louis 2, Missouri

FROM: (Organization and Location) US Army Aviation School Regiment, Department of Maintenance, Fort Rucker, Alabama

SUPPORTING FIELD MAINTENANCE UNIT: Hayes Aircraft Corporation

MAJOR COMMAND: Third Army

| ENGINE DESIGNATION | ENGINE SERIAL NUMBER | AIRCRAFT DESIGNATION | NO. OF PREVIOUS OVERHAULS | LAST OVERHAUL AGENCY CODE | ENGINE POSITION NO. | ENGINE HOURS SINCE NEW | ENGINE HOURS SINCE OVERHAUL START | ENGINE HOURS SINCE OVERHAUL END | STARTING CODE | ENDING CODE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| a | b | c | d | e | f | g | h | i | j | k | l |
| O-335-5B | E590267 | H-13E | 1 | 03 | 1 | 611 | 0 | 4 | 2 | AA | Installed engine on a/c rec'd during month |
| O-335-6B | E600950 | H-23B | 0 | -- | 1 | 0 | 0 | 0 | 3 | AA | Spare engine installed during month |
| R-985-AN-1 | 41-5376 | L-20A | 5 | 38 | 1 | 3856 | 651 | 708 | 1 | AA | Installed engine on hand beginning of month |
| O-470-11 | T101109 | L-19A | 0 | - | 1 | 1051 | 1043 | 1051 | 1 | 169B | Maximum operating time |
| O-480-1 | L732-33 | L-23D | 0 | - | 1 | 456 | 447 | 456 | 1 | 142F | Failure of master rod or link rods |
| O-480-1 | L-706-33 | L-23D | 0 | - | 2 | 359 | 343 | 359 | 1 | 225Z | Field maintenance |
| O-470-11 | T-102043 | L-19A | 1 | 03 | 1 | 983 | 192 | 193 | 1 | 379C | No maintenance required |
| R-1820-103 | BLE519771 | H-21C | 0 | - | 1 | 41 | 32 | 41 | 1 | 475C | Overspeed |
| R-1300-3 | E482072 | H-19D | - | - | - | - | - | - | 4 | - | Serv spare in stock beginning of month |
| R-1820-103 | BL519984 | H-21C | - | - | - | - | - | - | 5 | - | Awaiting return to overhaul facility |
| R-1340-59 | JP110021 | U-1A | - | - | - | - | - | - | 6 | - | In transit to overhaul beginning of month |
| O-435-17 | 2566-11A | L-23 | 2 | 03 | - | - | - | - | 7 | - | In transit from supply depot beginning of month |

DATE: 10 Sep 1960

TYPED NAME OF PREPARING OFFICER: JOHN J. JONES, Capt

SIGNATURE: John J. Jones

DA FORM 1 FEB 57 1890

U S GOVERNMENT PRINTING OFFICE 1957 O 416763

*Figure 9-4. DA Form 1890, Installed and Spare Aircraft Engines.*

to U. S. Army Transportation Materiel Command, St. Louis 2, Mo., with an information copy to the appropriate ZI or oversea Army commander or Department of the Army staff agency. National Guard units will submit the report through the State adjutant general to U. S. Army Transportation Materiel Command with an information copy to Chief, National Guard Bureau, Washington 25, D. C. See AR 700–2800–2 for complete instructions on the preparation and submission of this report.

*b.* Information for preparing this report can be obtained from the aircraft flight reports and maintenance records and the historical records for aeronautical equipment.

## Section III. CHARTS AND BOARDS

### 9–13. Aircraft Daily Status Chart

*a.* An aircraft daily status chart (fig. 9–5) may be maintained to expedite the preparation of DA Form 1352 (par. 9–11). This chart may be made on 8½ by 13-inch typing paper, with a new sheet for each month, or a more permanent acetate-covered chart may be hung on the wall and used month after month.

*b.* Daily entries will show the exact status of the aircraft at the *beginning* of the operational day. Entries will be indicated by coloring the appropriate blocks in accordance with this code: flyable, green; EDP (equipment deadlined for parts), red; field maintenance, blue; and modification, yellow.

*c.* Aircraft organizational maintenance will be indicated by one of these entries: *P*( ), periodic inspection with the number of the PE in parentheses; *R*, organizational maintenance which is not a scheduled inspection. Half days of organizational maintenance will be indicated in the same way, except that the block will be divided by a diagonal line (/) and the symbol entered in only one portion of the block.

*d.* If the aircraft status changes during the day from or to EDP, field maintenance, or modification, this change will be shown on the chart the day following.

*e.* An aircraft for which accountability is lost will be indicated by an L in the status block for the day accountability was terminated. This L will be followed by the number of hours (to the nearest full hour) the aircraft was flown during that portion of the month.

### 9–14. Aircraft Daily Status Report

An aircraft daily status report (fig. 9–6) is required by unit aviation officers, unit commanders, and staff officers. This report

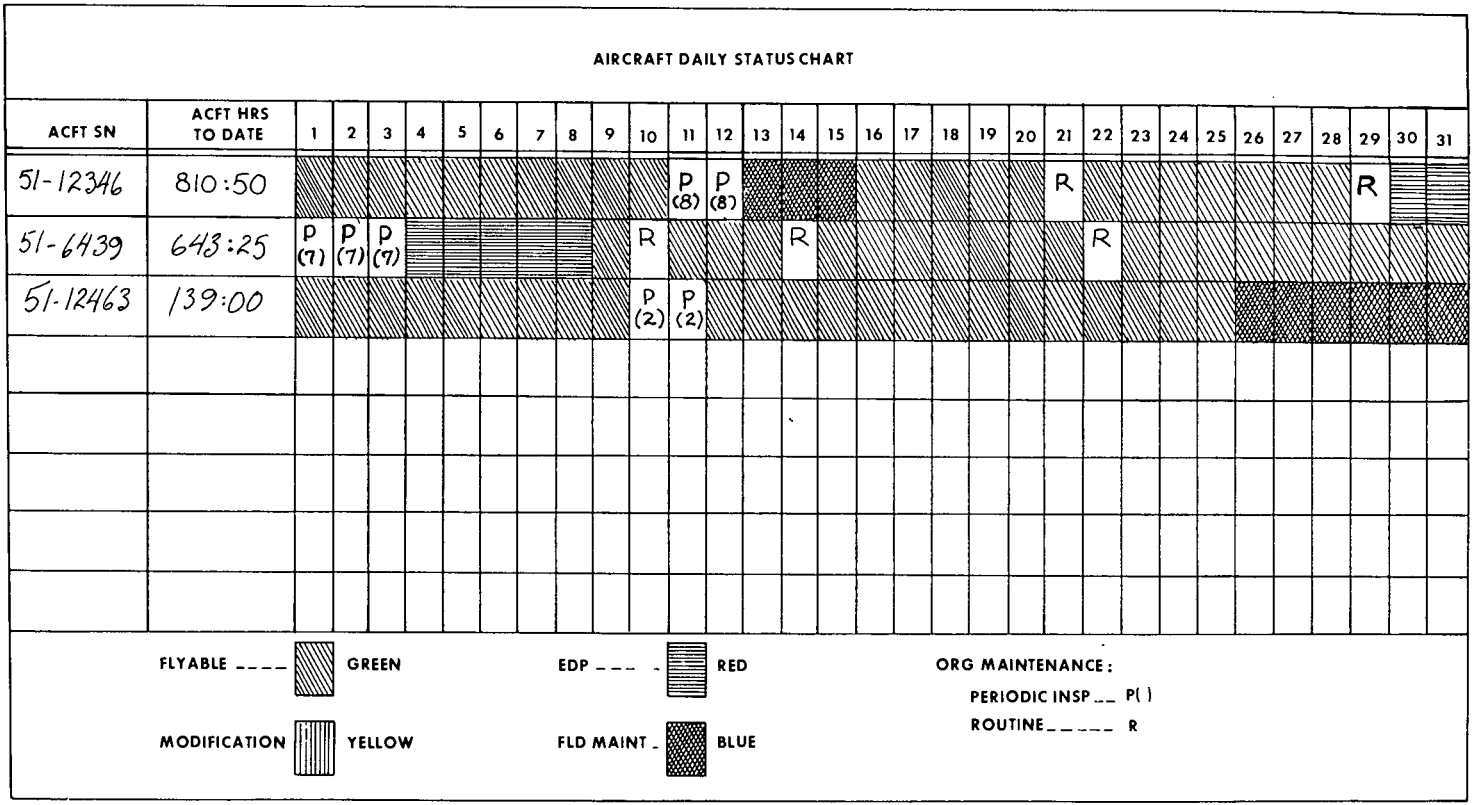



*Figure 9–5. A type aircraft daily status chart.*

DAILY AIRCRAFT STATUS REPORT

| | L–19 | L–20 | L–23 | H–13 | H–19 | H–21 | H–37 |
|---|---|---|---|---|---|---|---|
| ASSIGNED* | 16 | 6 | 1 | 20 | 8 | 6 | 2 |
| FLYABLE | 13 | 5 | 1 | 15 | 6 | 4 | 2 |
| RELEASED | | | | | | | |
| EDP | 1 | | | | 1 | 1 | |
| FIELD MAINT | | 1 | | 2 | | | |
| ORG MAINT** | 2 | | | 3 | 1 | 1 | |
| OTHER | | | | | | | |

*INCLUDES ALL AIRCRAFT ASSIGNED MAINTENANCE.
**INCLUDES TECH INSPECTION AND TEST FLIGHT.

NONOPERATIONAL BREAKDOWN

| ACFT TYPE | ACFT SERIAL NR. | DATE GROUNDED | EDP OR FM | REASON |
|---|---|---|---|---|
| L-19 | 50-1463 | 3 FEB 60 | EDP | PROP |
| H-13 | 51-2526 | 9 FEB 60 | FM | TM MOD |

*Figure 9–6. A type aircraft daily status report.*

is valuable in the coordination between the maintenance officer and the operations officer; it helps the maintenance officer schedule maintenance so as to control the equitable distribution of time spent on the aircraft.

## 9–15. Accessory Replacement Schedule

*a.* Accessory replacements should be ordered far enough in advance to insure that they will be on hand when needed. An accessory replacement schedule (chart) (fig. 9–7) lists the aircraft, the accessories listed in the appropriate TM –6, and the hours accessories are due for replacement. The column "Hours to Date" is kept current. During the PE just prior to the one when replacement is to be made, a parts request is submitted to technical supply and the replacement time on the chart is circled (indicating that the part has been requisitioned). This time will remain circled until the replacement has been accomplished; then the new replacement time will be entered in this block.

*b.* The accessory replacement schedule can be modified by adding three columns to show the current status of assigned aircraft. These columns will be labeled—

(1) *Next inspection due.* This column will indicate the next scheduled inspection (e.g., *P*(*4*)).

(2) *Aircraft hours due.* This column will show the aircraft hours since new or IROAN at which the next scheduled inspection ((1) above) is due. This figure will be exact, not the nearest whole hour.

(3) *Hours to go.* This column will give the time remaining before the inspection is due. The entry, which may be rounded off to the nearest whole hour, is changed each day the aircraft is flown, and aids in the proper scheduling of maintenance.

## 9–16. Familiarization Chart

*a.* To insure that personnel are familiar with the contents of each technical manual publication pertaining to their individual responsibilities, a technical manual familiarization chart (fig. 9–8) is maintained. This chart lists all technical manuals pertinent to assigned aircraft and associated equipment. The mechanic initials the appropriate block to indicate that he understands the applicable publications.

*b.* Small organizations (10 persons or less) may require mechanics to initial the publication instead of maintaining a chart to indicate that they understand the contents.

L-19 ACCESSORY REPLACEMENT SCHEDULE*

| AIRCRAFT SERIAL NUMBER | AIRCRAFT HOURS TO DATE | FLAP MOTOR | MASTER BRAKE CYLINDER | FLEXIBLE HYDRAULIC HOSE | ENGINE | FUEL PUMP (ENGINE DRIVEN) | AUXILIARY FUEL PUMP | OIL COOLER AND REGULATOR | SPARK PLUGS | PROPELLER | PROPELLER GOVERNOR | PROPELLER (TL 19D) | GENERATOR | VOLTAGE REGULATOR | REVERSE CURRENT RELAY | AIRCRAFT INSPECTION STATUS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | NEXT INSP DUE | ACFT HOURS DUE | HOURS TO GO |
| 55 4667 | 432 45 | 1000 | 1200 | 1000 OR 5 YRS | 1000 | 1000 | 1000 | 1000 | 200 | 1500 | 1000 OR 2 YRS | 800 OR 2 YRS | 1000 | 800 | 1200 | 5 | 450 | 17:15 |
| 56 2493 | 89 20 | 1000 | 1200 | 1000 | 1000 | 1000 | 1000 | 1000 | 200 | 1500 | | | 1000 | 800 | 1200 | 1 | 100 | 10:40 |
| 51 15632 | 805 25 | | 1200 | 1000 | 1000 | 1000 | 1000 | 1000 | 200 | 1500 | | | 1000 | 800 | 1200 | 14 | 850 | 44:35 |

*THE REPLACEMENT OF ACCESSORIES VARIES WITH TYPE AIRCRAFT
ALL TYPES MAY BE PROVIDED FOR ON ONE CHART OR BOARD
OR A SEPARATE BOARD FOR TYPE AIRCRAFT.

*Figure 9–7. A type accessory replacement schedule.*

| TECHNICAL MANUAL | M/SGT JONES | M/SGT SMITH | SFC LAYMAN | SFC GAST | SP 3 MIKE | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TM 1–1L–19A–1 | J | S | L | | | | | | | | | | | | | |
| TM 1–1L–19A–2 | J | S | L | | M | | | | | | | | | | | |
| TM1–1L–19A–3 | J | S | L | | | | | | | | | | | | | |
| TM 1–1L–19A–4 | J | S | L | | M | | | | | | | | | | | |
| TM 1–1L–19A–5 | J | S | L | | | | | | | | | | | | | |
| TM 1–1L–19A–6 | J | S | L | | | | | | | | | | | | | |
| TM1–1L19A–17 | J | S | L | | | | | | | | | | | | | |
| TM 1–1L–19A–18 | J | S | L | | M | | | | | | | | | | | |
| TM 1–1L–19A–20P | J | S | L | | M | | | | | | | | | | | |
| TM 1–1L–20A–1 | J | S | L | G | | | | | | | | | | | | |
| TM 1–1L–20A–2 | J | S | L | G | | | | | | | | | | | | |

*Figure 9–8. A type technical manual familiarization chart.*

## 9–17. MWO Compliance Record

*a.* A consolidated MWO compliance record (fig. 9–9), showing those MWO's which have not been fully complied with, will be maintained in the maintenance office of all maintenance units. This record may be kept on charts, Kardex files, cards, or any other form from which commanders can readily determine the status of each assigned aircraft for MWO noncompliance.

*b.* The consolidated record will contain this information:

(1) Type, model, and serial number of all assigned aircraft.

(2) All applicable MWO's not fully complied with.

(3) Status of compliance for those MWO's not complied with, including the MWO number, date of issue, expiration data, and requisition number of technical manual kit.

## 9–18. Other Charts (Boards)

*a. Nonoperational Status Board.* This board shows the current status of nonoperational aircraft only. It indicates—

(1) Type of aircraft.

(2) Aircraft serial number.

(3) Date grounded.

(4) Whether the aircraft is in field maintenance or EDP.

(5) Reason grounded.

(6) Estimated date of completion and man-hours required.

*b. Bulletin Board.* A bulletin board is essential for displaying local regulations, information notices, lists of mechanics authorized to taxi and run up aircraft, etc.

*c. Unit Organizational Chart.* This chart (fig. 9–10) shows the organization of the aviation battalion and should be posted in the maintenance office to familiarize personnel with the organization of the unit.

## 9–19. Maintenance Allocation Charts

*a. Definition.* The maintenance allocation chart (MAC), as prescribed in AR 750–6, is the part of the technical manual which applies the established maintenance concept for each aircraft. It assigns maintenance functions and repair operations to be performed by each echelon of maintenance. It is the basis for the establishment of tool sets, the selection of parts, special tools, and equipment, and the information in supply catalogs.

*b. Purpose and Standards.* Maintenance allocation charts standardize the echelon of maintenance at which a maintenance

| MWO NUMBER | DATE | COMPLIANCE SPECIFICATION |
|---|---|---|
| 55-1520-204<br>-20/1 | 30 DEC 60 | ☑ URGENT ACTION<br>☐ ROUTINE ACTION<br>☑ NOT LATER THAN 10 DAYS AFTER<br>☐ NOT LATER THAN _____ DAYS AFTER RECEIPT OF KIT<br>☐ NOT LATER THAN _____ DAYS AFTER RECEIPT KIT PARTS<br>☐ FIELD MAINTENANCE<br>☐ DEPOT MAINTENANCE<br>☑ ORGANIZATIONAL MAINTENANCE |

| EQUIP I D AND SERIAL NO. | EFFECTIVE DATE | EXPIRATION DATE | COMPLIANCE DATE | REASON FOR NONCOMPL |
|---|---|---|---|---|
| H-13 H<br>59-4932<br>59-4954 | 30 DEC 60 | 9 JAN 61 | | |

*Figure 9–9. A type MWO compliance record.*

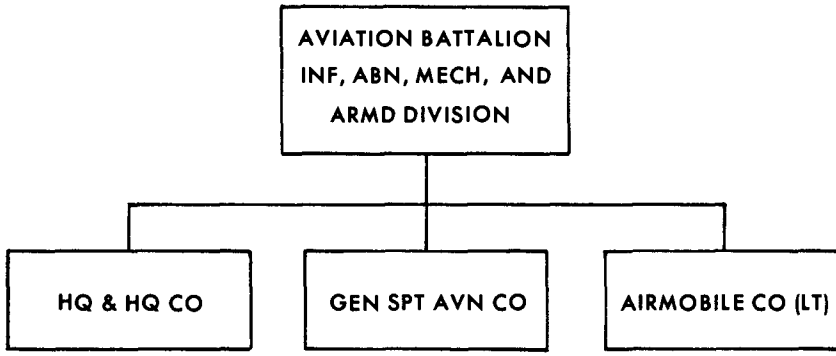



*Figure 9–10. Aviation battalion—infantry, airborne, mechanized, and armored divisions.*

function will be performed. For example, the replacement of engines and cylinder and piston assemblies has been assigned to third echelon for all aircraft. Deviations from the standard are based on the particular aircraft and the functions involved. The MAC lists the standards for determining the echelons of maintenance for each function. Factors to be considered are the—

(1) Distribution of aircraft.
(2) Frequency of occurrence of a maintenance function.
(3) Complexity of the maintenance function.
(4) Range, type, and size of parts required.
(5) Equipment required.
(6) Maintenance man-hours required.
(7) Administrative costs incurred in the repair or overhaul of parts removed.
(8) Mobility requirements.
(9) Availability of men to fill MOS vacancies.

# CHAPTER 10
# SUPPLY

## Section I. AVIATION TECHNICAL SUPPLY

### 10–1. Technical Supply

*a. Relationship to Unit Supply.* Army aviation technical supply is a part of the supply section of the organization. It is subject to the same inspection and supervision exercised over the unit supply. To establish efficient, economical technical supply for Army aircraft, normal supply procedures vary because of aircraft location in relation to the parent organization or because of the problems peculiar to aircraft operations.

*b. Authority and Scope of Operation.* For efficiency of operation, the aviation technical supply officer (assistant maintenance officer) will follow the procedures authorized for separate companies and detachments as given in AR 735–35. All technical service items necessary for aircraft operation, less TOE property, will be handled by the technical supply officer.

*c. Guide Lines for a Type Technical Supply.*

(1) The technical supply of an aviation unit will maintain a 15-day stock level of spare parts based on the MAC and dash 20P's of the TM 55-series for each aircraft.

(2) Requisition and turn-in of all parts for assigned aircraft will be made on DA Form 1546 (Request for Issue or Turn-in) in accordance with AR 735–35.

(3) All repair parts in the stockage level will be tagged as to nomenclature and Federal stock number (FSN) and stored in bins which have been numbered for easy reference.

(4) Aircraft hardware will be stored separately, and plainly marked for efficient issue.

(5) The technical supply will vary according to the size of the unit. It may be located in a van which is complete in itself, or in a small wall tent, or even in the back of a ¾-ton truck or trailer. Wherever technical supply is set up, it must be close to the maintenance area so that issue and turn-in of supplies and repair parts will be orderly and efficient and will not hinder aircraft maintenance.

(6) Tool sets (other than the general mechanics' tool sets) and special tools must be plainly labeled as to nomenclature and FSN and kept so that issue to the individual mechanic is controlled.

(7) The maintenance officer must be constantly alert for ways to simplify and expedite supply action in accordance with directives and local policy. A followup must be made on requisitions that receive no apparent action, and the equipment deadline for parts (EDP) requisitions must be kept current. Those that have become less urgent through other supply action must be downgraded.

(8) The DA Form 1546 (Request for Issue or Turn-in) is a *one-line* item requisition. Proper use of the form will assure a backup of repair parts in the chain of supply if the maintenance officer trains and closely supervises his technical supply personnel in making timely requisitions of repair parts. When a repair part is issued from stock, another one must be requisitioned immediately; thus, a true usage factor will be obtained and a better, faster resupply will be established.

*d. Requesting Procedure.*

(1) Requests for aircraft repair parts will be submitted to technical supply on DA Form 9–79 (Parts Requisition) by the crew or section chiefs. This form will contain amount requested, Federal stock number, part number, a brief description of the item or items, and authorized publication used. Authorized publications are the dash 20P of the TM 55-series for each type aircraft. The DA Form 9–79 will be signed by the maintenance officer or his authorized representative.

(2) Technical supply personnel will check the stockade for the item(s) requested and, if not on hand, a DA Form 1546 will be prepared and submitted immediately to the next higher echelon of supply.

(3) The DA Form 9–79 will be placed in a suspense file for a period of 90 days or until the requested spare part has been received. If no action has been taken in 90 days, the DA Form 9–79 will be rechecked to see if the part is still needed; if not, DA Form 1546 will be cancelled.

*e. Requisitioning by DA Form 1546.*

(1) The DA Form 1546 will be typed or written in ink and a requisition number assigned.

(2) The brown suspense copy (No. 4) will be held in suspense.

It will be inserted in the visible file (Kardex file), permitting the colored edge to be seen through the title insert window. If an aircraft action file is used to keep all requisitions for a specific aircraft consolidated under the aircraft number, the brown suspense copy could be filed there.

(3) All remaining copies of DA Form 1546 will be sent to the technical service having the supply responsibility for the item requested.

(4) Upon receipt of a partial action or a red "due-out" (No. 3) copy of DA Form 1546, the brown copy (No. 4) will be replaced by the red copy (No. 3). The No. 4 copy will then be destroyed.

*f. Description of DA Form 1546.*

(1) DA Form 1546 is used with the Army Field Stock Control System to effect a direct and expeditious means of issuing all items of supply (except ammunition) without interfering with the responsibilities of commanders in connection with supply activities. This request flows through supply channels, without consolidation, to the first technical service stockage point where supply action is taken without delay.

(2) DA Form 1546 is a 7-part, carbon-backed, snapout form, 5 x 8 inches including stub, designed to initiate a request or turn-in for a single line item.

(*a*) Copy No. 1, the blue shipping copy, is used as a voucher copy for retention by the accountable property officer.

(*b*) Copy No. 2, the green voucher copy, is used as the financial management copy for financial inventory accounting (FIA) and other financial data.

(*c*) Copy No. 3, the red "due-out" copy, is used as the action copy if initial, partial, or full amount is due out. It is returned to requester for suspense, pending release of quantity indicated as "due-out" in block 27.

(*d*) Copy No. 4, the brown unit suspense copy, is retained at the requesting organization.

(*e*) Copy No. 5, one of the black utility copies, is used as a demand copy for forwarding to the appropriate technical service collection and analysis agency.

(*f*) Copy No. 6, the other black utility copy, is used as a shipping copy and returned with the supplies to the requesting organization.

(*g*) Copy No. 7, the hardback demand data copy, is used

as a permanent demand data record by the accountable property officer.

*g. Instructions for Completing DA Form 1546.*

(1) AR 735–35 contains full instructions for completing DA Form 1546 and lists the necessary registers, voucher files, and hand receipts to be maintained.

(2) The same copy of this form *cannot* be used for a request and a turn-in. Each transaction must be separate and distinct.

*h. Requesting Stock Items Where Complete Supply is Effected.*

(1) Complete blocks 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14 or 15, and 18.

(2) Enter any pertinent information not covered elsewhere on the form in block No. 36.

(3) Enter current date and signature of requesting officer in designated block.

(4) Remove copy No. 4 for unit suspense file.

(5) Forward copies 1, 2, 3, 5, 6, and 7 to supporting supply organization.

*i. Requirements Upon Completion of Supply Action.*

(1) Check to insure receipt of requested items, shipping copy of request, and a preprinted DA Form 1546 if *item is authorized to be stocked.*

(2) Remove copy No. 4 (brown) from the file and destroy. Insert location of part, if it is to be stocked, in title insert.

(3) Insert preprinted DA Form 1546 in suspense file.

(4) Place copy No. 6 (shipping copy) in completed file, in Federal stock number sequence.

*j. Due-out and Partial Due-out.*

(1) Remove copy No. 4 (unit suspense copy) from suspense file and destroy. If partial shipment, insert location of part in title insert.

(2) Insert returned copy No. 3 (due-out copy) in suspense file. (This indicates a due-out from the supply organization and that these items are due in.)

(3) Insert preprinted request for issue or turn-in in the suspense file.

*k. Receipt of Due-in Items.*

(1) Check copy No. 6 with quantity received and compare with copy No. 3 (due-out copy) of DA Form 1546 to insure receipt of requested quantity.

(2) If all due-ins have been received, remove copy No. 3 (due-out copy) of submitted request from suspense file and destroy.

(3) If only part of the due-in items was received, a copy No. 3 (due-out copy) will be furnished for all items remaining due-in. The latest copy No. 3 should be placed in the suspense file to indicate the current status of the item.

*l. Request for Nonstock Items.*

(1) Prepare DA Form 1546 for nonstock items the same as for stocked items.

(2) Retain copy No. 4 and place in suspense file.

(3) Due-out and partial due-out items are treated the same as for stocked items.

*m. Stock Number Change or Substitution.*

(1) In the event of a change in the stock number of the requested item, the requesting organization will receive copy No. 6 (shipping copy) or copy No. 3 (due-out copy) of the request, with the stock number change indicated in block 22, and a preprinted DA Form 1546 with the new number for those items authorized to be stocked.

(2) Upon receipt of change, the requesting organization will destroy all previous preprinted Request for Issue or Turn-in forms which show the old number and will make changes in all publications as appropriate.

(3) If a substitute item is issued ILO (in lieu of) the requested item, the substitution number will appear in block 23 on the shipping copy of the requisition.

(4) Record substitute data on title insert.

*n. Use of Preprinted DA Form 1546.*

(1) Concurrent with the supply action of request, a preprinted DA Form 1546 will be prepared and issued by the supplying organization for those items authorized to be stocked.

(2) Preprinting will be accomplished in blocks 7, 8, and 9 to insure correctness of part number and item name on future requirements of the same item. It also provides the authority for future issues.

(3) Preprinted DA Form 1546, upon issue to a requesting organization, will be maintained in a suspense file in stock number sequence.

## 10–2. General Supply Classification

Army aircraft are classified as principal air items. Other air items are classified as secondary items. Authorization tables (TOE,

EML, TA, circulars, approved projects, and letters of special authority) afford requisitioning authority for principal items. Secondary air items are subdivided into regulated and nonregulated categories. Regulated and nonregulated items may be further classified as *critical* or *rapid service* items.

## 10–3. Critical and Rapid Service Secondary Air Items

*a.* A critical secondary air item is an essential item which is in short supply, or expected to be in short supply, for an extended period.

*b.* An *essential* item is defined as an aircraft item which will cause EDP if not made available.

*c.* A *rapid service* item is a stocked type item of supply designated for expedited supply action in the interest of overall supply economy.

*d.* A critical-item list is published periodically in Supply Bulletin 1–15-series. These bulletins are distributed to field maintenance installations designated in AR 750–770, to oversea supply agencies, and to CONUS and overseas commanders. When an emergency or special requirement exists for a critical item, qualifying terms such as AR 11–8, EDP, POM (preparation for overseas movement), etc., should appear on the requisition.

## 10–4. Regulated Secondary Air Items

Regulated secondary air items are expensive items or those having a long procurement lead time. Office Chief of Transportation exercises close supervision of individual requisitions to insure proper distribution to units and commands in accordance with Department of the Army priorities. Transportation Corps regulated items are listed in SB 55–28.

## 10–5. Expendable Items

Expendable items are those items consumed in use, and such spare or repair parts which lose their identity when used to repair or complete other articles. Classification of reparable items as *expendable* does *not* prohibit their reclamation for repair.

## 10–6. Nonexpendable (Reparable) Items

Nonexpendable items are those items which retain their identity and are not consumed in use. They flow continuously around the supply pipeline: as *serviceable* from the depot to the issuing agency to the using unit, and as *reparable* from the Army using unit back to the field maintenance activity (where the items are repaired or forwarded for fifth echelon repair). An item is either con-

demned or repaired and returned to serviceable stock. Normally, upon removal from an aircraft, nonexpendable items are repaired by the Army activity to which the aircraft is assigned, or sent to the Army field maintenance activity. The depot concerned schedules the repair, maintenance overhaul, or rebuild, and returns the item to serviceable stock.

## 10–7. Federal Supply Classification

The Federal Supply Classification (FSC) uses a four-digit coding system. The digits of the code number identify the subclass within the group. The primary application of the FSC class code number is in the Federal stock number, which consists of the applicable FSC class code number plus the seven-digit Federal item identification number.

## 10–8. Army Field Stock Control System (AFSCS)

*a. General.* The Army Field Stock Control System (AFSCS) facilitates the economic distribution of secondary items, with particular emphasis on repair parts. Its objective is to insure that an adequate amount of supplies is in the proper place at the proper time without overstocking at any point of supply. This objective is attained through use of the AFSCS as a tool of operation and management. This system provides for—

(1) Establishment of a realistic stockage plan (item and quantitative) at all echelons of supply, based upon demand data of the activities supported. Stocks are maintained in direct relation to consumer requirements.

(2) Establishment of a uniform method of supply accounting among all technical services at the forward supply echelon.

(3) Establishment of realistic replacement factors for computing requirements, using demand data experience.

(4) Establishment of realistic organization allowances, based upon demand data experience.

(5) Establishment of improved parts list, based upon demand data experience.

(6) Establishment of a method whereby the effectiveness of the supply and maintenance activity may be determined.

(7) Reduction of the number of items and quantities of items at forward supply echelons.

(8) Reduction of storage and accounting costs at forward supply echelons by the reduction of items stocked.

*b. Selective Stockage Plan.* This plan employs the principle of selecting and stocking fast-moving items at forward echelons and

slower-moving items at rear echelons. A relatively small number of repair parts (approximately 15 percent) is used to accomplish a very high maintenance return (approximately 85 percent). Under the selective stockage plan, those items are selected which account for the largest volume of business and such items will be stocked at the direct support level.

*c. Consumption Demand Data.* The most important element to which any supply system is geared is the rate at which any item is demanded for consumption. This rate is the basis for computing requirements and for effecting sound procurement. Provisions have been made in the Army Field Stock Control System for the recording of true consumption demand data at the installation level of supply and the reporting of this data to U. S. Army Transportation Materiel Command. Prior to the inception of AFSCS, requirements computed at all echelons were based on "issue experience" rather than "demand experience." The use of "issue experience" results in stockage of the items which were actually issued rather than the items which were demanded. For example, if a substitute item is issued due to lack of stock for the item demanded, accumulation of "issue experience" results in the increased stockage at all levels of supply for the substitute item and no stockage for the item demanded. Accumulation of "demand experience" results in the stockage requested.

*d. Unit Single Line Requisitioning.*

(1) The AFSCS sets up a procedure whereby the using units and organizations may requisition daily the TC secondary air items they need by single lines placed on Request for Issue and Turn-in (DA Form 1546).

(2) The user (units) will be initiate action by the most expeditious means available to notify the property book officer of requirements (AR 735–35). The property book officer will prepare DA Form 1546 and is responsible for assuring that the document is legible, complete, accurate, and that the item requested is within authorized allowances.

(3) The single line requisition flows through the supply channel, without consolidation, to the first technical service stockage point, where supply action is taken without delay. As stated in AR 711–16, the fact that consolidation of requisitions is eliminated does not lessen the responsibility of supply officers for maintaining a well-managed supply system.

(4) TC secondary air items are turned in to the field maintenance supply officer on DA Form 1546. The turn-in of an unserviceable part and the obtaining of a replacement

need not be done simultaneously. Turn-in procedure for TC secondary air items is contained in AR 711–16.

## Section II. SUPPLY PROCEDURES

### 10–9. Source of Supply

AR 725–750 designates the source of supply for Transportation Corps supplies and equipment, including Transportation air items. The primary function of the technical supply section is to receive, record, store, and issue replacement parts requisitioned from these sources.

### 10–10. Replenishment of Stocks

Organizational stocks are replenished so as to maintain prescribed stock levels. Requisitions will contain only those items on the authorized stock list, and will be for the quantity required to bring the total on hand and on order to meet the requisitioning objective.

### 10–11. Stock Levels

DA technical manual dash 20P of the TM 55-series for each type aircraft constitutes authority for stockage by using organizations. However, a conditionally extended scope of maintenance may be authorized by field maintenance activities (AR 750–5). Unit commanders are required to constantly review stocks due in. Notices of cancellation are sent to the field maintenance supply officer for items or quantities which are no longer required. Anticipation of usage is continually checked. Items which have not been used within 30 days are returned to the field maintenance supply officer, except where there is a firm commitment for the item.

### 10–12. Turn-In Procedures

*a.* Aircraft supplies are returned to the field maintenance supply activity on DA Form 1546.

*b.* Turn-in slips for serviceable and unserviceable supplies are presented with the property to Transportation supply.

*c.* Turn-in slips listing aircraft engines show engine hours since new or last overhaul and reasons for removal.

*d.* Turn-in slips listing items included on Unsatisfactory Reports (UR's) (DD Form 1275) refer to the UR report number. All exhibits, when applicable, are also shown on the turn-in slip.

*e.* Turn-in slips for excess supplies include a statement that supplies listed are excess to organizational requirements.

*f.* Items turned in are preserved in accordance with applicable MIL specifications. Items not properly prepared for storage are returned to the unit.

*g.* Items listed on UR's will be tagged with a UR identification tag and a reparable or rework tag showing the report number. Each item is accompanied by a legible copy of the UR and is turned in to the field maintenance supply office without delay.

*h.* Reparable assemblies, gear boxes, and rotor blades are accompanied by complete historical records at time of turn-in.

*i.* Reparable air items are turned in promptly.

*j.* Due to the critical shortage of certain air items, and for better supply economy, additional procedures are followed, namely:

(1) Each unit authorized Army aircraft continuously checks maintenance and supply sections for unserviceable air items removed from aircraft, and effects prompt turn-in to the supporting supply point.

(2) Unserviceable reparable air items removed from aircraft are properly tagged with a reparable or rework tag (AF Form 50D), including information as to the cause for removal of the item from the aircraft.

## 10–13. Special Supply Procedures

*a.* Issue slips submitted for replacement of reparable air items contain a statement that a like item has been turned in, and include reference to the turn-in voucher number or certification that the item will be turned in within 24 hours.

*b.* Scrap or salvage TC air items are turned in direct to the installation property disposal officer upon clearance by the field maintenance supply officer, under provisions of AR 735–11 and AR 755–6.

*c.* Common hardware items, such as bolts, nuts, cotter pins, bulk sheet metals and plastics, safety wire, etc., are issued in standard unit pack wherever practicable and economically feasible.

## 10–14. Supply Economy

Supply economy is the practice of conservation of materials by every individual in the Armed Forces; it is developed through training and practice until it becomes a habit. It includes conservation, maintenance, safeguarding, recovery, repair, and salvage of food, fuel, clothing, weapons, transport, expendable supplies, and all other supplies and equipment. Supply economy regulations are given in AR 711–10.

*a.* Commanders at all echelons will strengthen and enforce supply economy. Each individual must be conscious of the cost of careless use or hoarding of supplies and equipment. If total issues exceed authorized allowances, an unanticipated drain on appropriations will occur and, if permitted to go unchecked, will have a serious impact on the national economy. The personal example set by the commander and vigorous command supervision extending to all categories of supplies and to all individuals are the positive means of obtaining proper stock control and thus supply economy.

*b.* The commanding general of each continental army, each major oversea command, and the Military District of Washington will, from data available from the Unit and Installation Equipment Status Reporting System on major items of troop equipment in the command, take action necessary to accomplish supply economy.

(1) Army commanders should include in every phase of training a continuous indoctrination of all personnel in supply economy.

(2) They should insure that stock control activities of the unit organization, the station, and the theater are efficiently operated; that requisitioning objectives are correctly computed and continuously reviewed; and that when necessary these objectives are revised to keep them realistic.

(3) Stockage of supplies at a station and at user supply points should be held to the minimum, consistent with sound supply principles.

(4) Emphasis is placed on positive measures that insure conservation at all levels and that require units and individuals to operate within allowances.

(5) Requests for supplies should be carefully edited for conformance with allowances, to see that expendable supplies are not issued unless actually required, and to assure that issues in excess of allowances are completely justified.

(6) Proper accounting is made or payment rendered for Government property lost, destroyed, or damaged by individuals through causes other than fair wear and tear.

(7) Items of equipment held by a unit on memorandum receipt or company property record must agree with authorized allowances.

(8) Excesses on hand are returned to station stocks, and requests submitted for needed equipment must meet the authorized allowance or, where appropriate, current operating allowances.

(9) Organizational equipment may be transferred between organizations within the command as required to effect redistribution to all units in accordance with current priorities.

(10) Current operating allowances may be adjusted downward where necessary to make them consistent with the ability of the organization to store and maintain equipment.

(11) Equipment should be pooled and training schedules coordinated to fully utilize available equipment.

*c.* Heads of the Technical Services, within the scope of their responsibilities, must take necessary action to accomplish the objectives detailed in AR 711–10.

*d.* Some additional measures of supply economy are as follows:

(1) When performing maintenance, unused parts should be returned to the supply room immediately. This puts the part back into the supply channel and enables the technical supply clerk to maintain an accurate stock level.

(2) Tools will not be hoarded by individuals.

(3) Only parts and equipment that are needed will be ordered.

(4) When component parts are removed from an assembly, the reparable part will be cleaned and turned in to the technical supply clerk for repair processing.

## Section III. REQUISITIONING AND STORAGE PROCEDURES

### 10–15. General

*a.* Organizational supply establishes an operating supply of air items as listed in applicable DA supply manuals and maintains these supply levels in accordance with the instructions contained in the applicable TM –20P. Organizational requetss for supplies are directed to the appropriate property book officer (AR 735–35). The property book officer will, in turn, requisition supplies on the appropriate forms from the field maintenance supply officer at the supporting field maintenance activity.

*b.* Transportation air items listed in DA supply manuals 55–1 and 55–3-series, and the applicable –20P, –34P, and –50P manuals of the DA 5-part technical manuals are requisitioned from the initial source of supply in accordance with AR 725–5 or AR 725–8, except for those items and quantities distributed on an automatic basis in accordance with TOE's, TA's, and other applicable authorization documents.

*Note.* Recommendations for changes, additions, deletions, or other corrections to Transportation Corps SM's and/or TM's should be forwarded through

appropriate channels on DA Form 2028 to Commanding General, U.S. Army Transportation Materiel Command, P. O. Box 209, Main Office, St. Louis 66, Mo.

## 10–16. Organizational Coordination

Using units and organizations obtain supply support and effect turn-in of TC aviation items in accordance with AR 711–16 and AR 735–35, the former specifying use of DA Form 1546. Prior to submission of requisition by the most expeditious means or submission of DA Form 1546 for supply action, using units and organizations should insure that the following information is furnished when applicable:

*a.* The applicable TA or TOE when the request is for aircraft or special tools.

*b.* The applicable DA technical manual –20P when the request is for aircraft parts or special tools.

*c.* Certification of emergency issue slips according to the provisions of AR 711–16.

*d.* Aircraft type, manufacturer, model, series, and serial number when parts are requested for specific aircraft.

*e.* Type and number of aircraft supported when parts are requested for stock.

*f.* On requests for special tools, the number and type of aircraft serviced.

*g.* Items requested by Federal stock number and complete nomenclature as listed in applicable manual. The stock number of any substitute item issued ILO the item requested will also be shown. If the Federal stock number is not available, procedure set forth in AR 711–16 will apply.

*h.* Except for repair parts items which are not authorized by TA, TOE, and applicable authorization documents, processing of items is effected under provisions of AR 725–5.

## 10–17. Storage of Supplies

For complete information on storing air items at Army installations, see AR 711–16, AR 740–15, AR 743–41, and TM 743–200. In general, the following procedures govern:

*a.* Flammable supplies such as paints or dopes are stored away from buildings and equipment. Like items are grouped and properly tagged.

*b.* Frequently-used expendable items such as common hardware, rags, or lubricants may be shown as issued to the "shop" and placed in or near the working area for convenient use by maintenance personnel.

*c.* Parts such as spark plugs and fan belts may be kept in aircraft for emergency use, but must be properly accounted for.

*d.* Unserviceable items will be properly cleaned, tagged, and stored until turned in.

*e.* Tires will be placed upright in racks.

*f.* Other supplies will be kept in containers or in the packages in which shipped.

# CHAPTER 11

# MAINTENANCE SCHEDULING, METHODS, AND MARGINAL FACTORS

## Section I. MAINTENANCE SCHEDULING

### 11–1. General

Maintenance scheduling, which is the responsiblity of the unit maintenance officer, is necessary for high maintenance standards and efficient flight scheduling. It becomes more important when experienced maintenance personnel or facilities are limited. Administrative planning, if conducted properly, decidedly improves maintenance.

*a.* The basic requirement for scheduling aircraft maintenance is to control overall aircraft flying time so that scheduled inspection on one aircraft is completed before that on another comes due.

*b.* The operations officer must schedule aircraft carefully to obtain the average flying time needed each day. Mutual coordination between the operations officer and the maintenance officer must be effected on a continual basis so as to provide the number of aircraft needed to meet mission requirements and simultaneously permit adequate time for maintenance.

### 11–2. Time Utilization

Preventive maintenance is the first priority of organizational maintenance units. Replacement of parts and assemblies and minor repair as authorized by the pertinent MAC will be the prime mission.

*a.* To perform his job well and obtain a high aircraft availability, the organizational maintenance officer should insure that aircraft not flying are undergoing maintenance. This requires close supervision.

(1) When the aircraft is shut down, it should be serviced immediately for fuel and oil.

(2) The crew chief will check the pilot's remarks on DD Form 781–2 for any discrepancies found during flight and will correct them on the spot if practicable.

(3) If a discrepancy is not shown from the aircraft's last

flight, the DD Form 781–3 will be checked to see if a delayed discrepancy can be corrected during the downtime available.

*Note.* If condition (3) above fails to reveal maintenance which can be performed at the moment, a note will be made of discrepancies not corrected and a technical supply check conducted to determine the status of parts on requisition. In order to simplify checking on the part or parts required, a delayed discrepancy will always show by requisition number what has been requisitioned.

*b.* If discrepancies which can be corrected are not found on the DD Form 781–2 and the DD Form 781–3, the crew chief or mechanic should use available time to visually inspect those parts of the aircraft likely to cause trouble. Discrepancies are determined from aircraft maintenance experience based upon a knowledge of the existing mission, terrain, and climatic conditions. Careful inspection of the aircraft at every opportunity simplifies preventive maintenance.

*c.* During downtime, the crew chief or mechanic should check to determine when the next scheduled periodic inspection is due. If the periodic inspection is due within 2 or 3 hours, phases of the inspection that do not require teardown of a component may be completed. The aircraft, however, must remain available for flight on a moment's notice.

## 11–3. Coordination With Operations

By inspecting his aircraft status board, the maintenance officer can foresee the probability of major inspections becoming due for two or more aircraft at or near the same time. If this occurs, he should coordinate flight scheduling with the operations officer to arrange major inspections on a staggered schedule. If this arrangement is inadequate and inspections become due at or near the same time, the maintenance officer must schedule the inspection of one aircraft before the actual time for the major inspection, and/or delay the other inspection until permitted by the workload.

## 11–4. Deferred Maintenance (Negligible Damage)

*a.* In the past, numerous cracks, dents, scratches, or wrinkles in the aircraft skin or component parts have either been repaired or parts removed which could have been considered as *negligible damage* and continued in service. Small dents and wrinkles noted during inspection will *not* be written up on the DD Form 781–2 as discrepancies, transferred to the DD Form 781–3, and carried continuously without corrective action.

*b.* Negligible damage is damage or distortion which may be

permitted to exist or may be corrected by simple procedures. This may include removing dents, stopdrilling cracks, or temporarily patching, without placing a restriction on flight.

(1) Negligible damage is considered deferred maintenance and is a responsibility of organizational maintenance.

(2) If feasible, negligible damage will be deferred until the time of scheduled maintenance.

*c.* To insure flight safety, care must be exercised in classifying any damage as negligible. Deep skin wrinkles of undetermined origin are not classified as negligible until the source of the damage has been determined. A minute inspection must be made to ascertain any possible damage to adjacent areas. Abnormal stresses incurred by shock or impact forces may be transmitted to the extremity of the structural members, resulting in secondary damage such as sheared or stretched rivets. Points of attachment must be examined for distortion and security of fastenings in primary and secondary damage areas.

*d.* No discrepancy suspected as a safety of flight factor will be considered deferred maintenance. Since the dividing line between a red diagonal and a red X condition is often indistinct, the maintenance officer must exercise caution. He must ground the aircraft if there is a reasonable doubt of flight safety in the discrepancy, and this may include the inability to obtain prompt enough advice from a higher echelon of maintenance. *Any* discrepancy that *could* become dangerous by continued use will be considered a red X condition.

## 11–5. IROAN Scheduling

The scheduling of aircraft to IROAN is the responsibility of the field maintenance facility. Normally, an aircraft that has been designated as an IROAN candidate will be evacuated immediately to the depot maintenance facility. See also paragraph 2–6.

## 11–6. Unscheduled Maintenance

*a.* Unscheduled maintenance is that maintenance which cannot be predicted. Unexpected aircraft difficulties or emergencies may occur which require prompt correction. Immediate action technical compliances may be received which ground all aircraft of a particular type until complied with.

*b.* If a needed part is not in stock or cannot be obtained through exchange in a short time, and if the mission justifies, the part can be removed from a nonflyable aircraft to make another aircraft flyable (AR 750–1500–8). In the field or in combat, when supply

lines are temporarily out of commission or supplies are delayed en route, the ingenuity of maintenance personnel should be used to increase the availability of aircraft.

*c.* If the unit receives an order to move on short notice, the maintenance officer or the unit commander must evaluate the condition of the aircraft and insure that they will not be left for salvage. An aircraft can be in a red X condition and still be safe for a *one-time flight.*

## Section II. METHODS OF PERFORMING MAINTENANCE

### 11–7. General

Four methods of performing maintenance are *dock, production line, crew chief,* and *progressive.* Factors to be considered in selecting a maintenance system include—

*a.* Size and mission of the maintenance organization.

*b.* Type and number of aircraft to be serviced.

*c.* Flying schedule.

*d.* Skill and experience of available personnel.

*e.* Available hangar and equipment facilities.

*f.* Climatic conditions.

### 11–8. Dock

*a. Description.* The dock method is the system by which periodic inspections and maintenance of aircraft are made at fixed docks equipped with workstands and testing apparatus. Specially trained crews move from dock to dock on a time schedule basis to accomplish their specific missions. When uncowled and cleaned, the aircraft is moved to the fixed location where it remains until inspection is completed.

*b. Purpose.* The dock method is designed to—

(1) Utilize inexperienced personnel to best advantage while developing their skill through a progressive on-the-job training program.

(2) Reduce the number of men necessary to maintain any given number of aircraft.

(3) Reduce the amount of equipment necessary for maintenance and fully utilize available equipment.

(4) Improve the condition of the aircraft through frequent maintenance and standardized inspections.

## 11–9. Production Line Method

*a. Description.* The production line method of maintenance is different from the dock method (fig. 11–1) in that the aircraft instead of the crews move from station to station. As the aircraft arrives at each station, specialists assigned to the station perform their specific checks and repairs in an allotted time. When the allotted time has elapsed, the aircraft is moved to the next station. If the work has not been completed, a "pad" crew (experts on maintenance performed at all stations) finishes the work at the succeeding station.

*b. Considerations.*

(1) *Breakdown of operations.* Logically, a mechanic should be assigned work on stations that are closely related and located in one area of the aircraft. Inspection and maintenance guides are a valuable aid to job breakdown.

(2) *Estimate of time per operation.* After observing the time spent on each operation, an estimate of the time required is made.

(3) *Sequence and division of operations.* The maintenance and the inspections are divided so that one does not interfere with the other.

(4) *Assignment of personnel to crews.* Personnel are distributed so that all operations can be completed within the same time interval.

*c. Disadvantages.*

(1) The production line method is not readily adaptable to variable workloads.

(2) It does not readily develop versatile, skilled personnel.

(3) It is not easily adaptable to accommodate different sizes and types of aircraft.

(4) Hangars and special equipment are required.

(5) Absenteeism and lack of parts and supplies may interrupt the flow of work.

## 11–10. Crew Chief Method

*a. Description.* The crew chief method of maintenance employs the crew chief as the specialist on his aircraft. He must be thoroughly familiar with the aircraft and with the status of the maintenance. This method is most practical in small units. If the unit is large enough to have specialists, the crew chief assigns inspection and repair activities to subordinates.

*b. Advantages.* When an inspection is due, the crew chief has

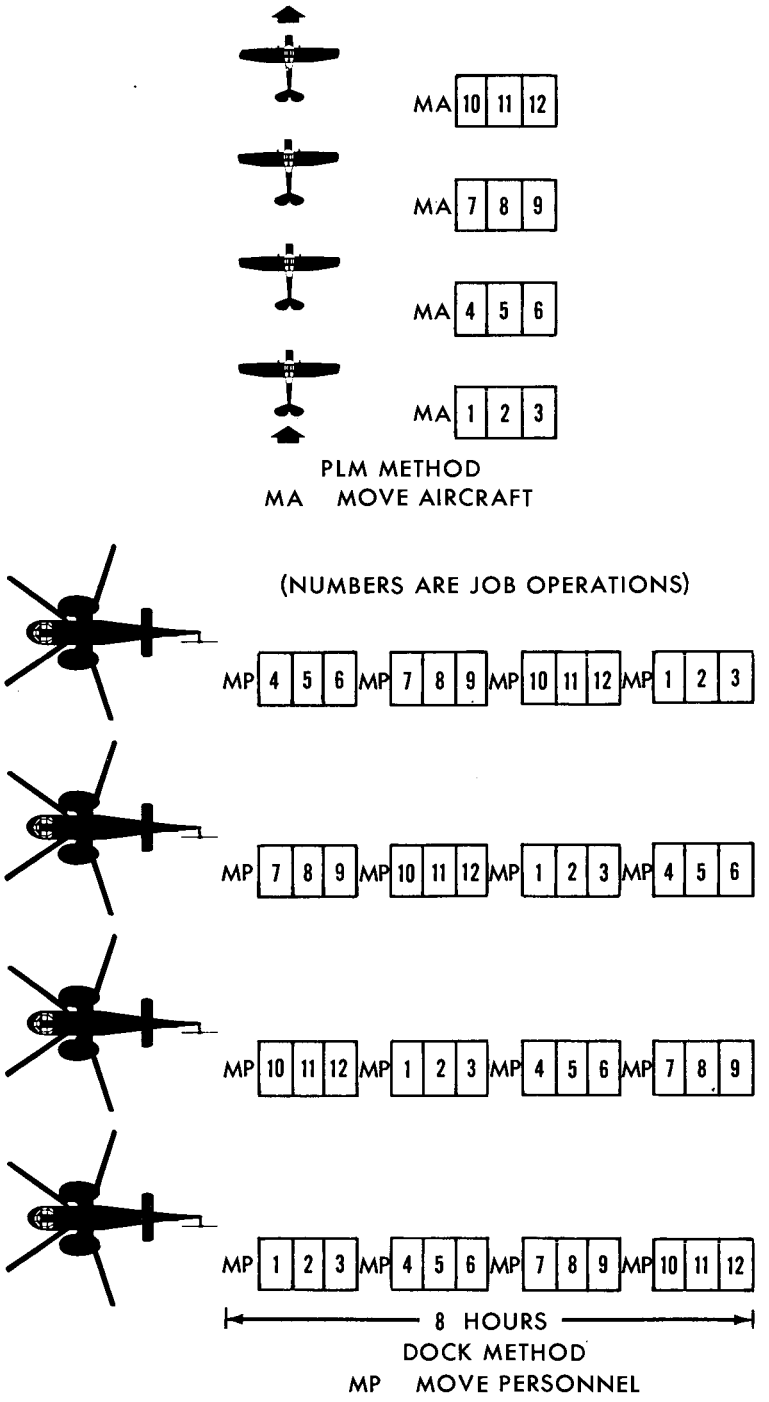



*Figure 11–1. Comparison of dock and production line methods.*

firsthand knowledge of the aircraft discrepancies. In larger and more complex aircraft the crew chief works in conjunction with a flight engineer. He performs preflight and periodic inspections, replaces parts, and increases his technical knowledge of the aircraft. This close contact with and thorough knowledge of the aircraft enables the crew chief to diagnose trouble while in flight, be alert for impending trouble, and efficiently maintain his aircraft while away from the base field.

*Note.* A combination of dock and crew chief methods is most often used at the organizational level.

## 11–11. Progressive Maintenance

*a. Description.* Progressive maintenance is that method in which scheduled maintenance is performed during the unavoidable downtime of the aircraft, thereby keeping the aircraft flyable during most of the time maintenance is in progress.

*b. Considerations.*

(1) The periodic inspection worksheets or cards must be grouped into stations on the aircraft so that once the cowling is raised on an aircraft for inspection, all necessary tests and inspections for that periodic will be performed in progressive sequence.

(2) Whenever the aircraft is on the ground for even an hour, the crew chief or mechanic must have necessary inspection workcards available and should perform whatever maintenance is possible at the particular station in the time allowed. When necessary maintenance has been completed, cards are initialed and aircraft time entered in the appropriate places by the crew chief or mechanic.

(3) The progressive maintenance program will be closely supervised so that all components or parts of the aircraft are inspected within the prescribed time limit.

(4) A red dash will be entered in the "status today" column during inspection; the column for pilot's and mechanic's remarks will explain that the periodic inspection is in progress.

(5) When a periodic inspection requires the disassembly of a component, it should be done as rapidly as possible during a time when the flight schedule for the aircraft permits.

(6) Maintenance accomplished on each aircraft must be accurately recorded to insure that no inspection phase has been omitted.

### 11–12. Continuous Preventive Maintenance

Continuous preventive maintenance is a refinement of progressive preventive maintenance. Instead of waiting until the inspection is due (based on the overall "PE due" time), the periodic inspection is "continuous."

*a.* As in progressive PM, the continuous method of PM requires the subdividing of the required aircraft inspections into systems. For example, the periodic inspection master control sheet for the H–21 (Shawnee) has a total of 13 systems.

*b.* Each system must be inspected on or before inspection due time. This means that each system has its own aircraft time when 100 hours of operation are completed. Conceivably, the aircraft could be undergoing some phase of the periodic inspection every time it is on the ground.

*c.* The flexibility of the continuous maintenance system permits distribution of the maintenance workload over a given period of time and allows maximum utilization of the aircraft and the maintenance personnel.

*d.* Rigid production control procedures must be implemented to obtain maximum effectiveness and to insure full compliance wtih inspection requirements.

*e.* Each system will have a specified aircraft-hours time when its periodic inspection time comes due. The file on the aircraft must be kept *current* to assure the prerequisites set forth in *d* above.

## Section III. MAINTENANCE UNDER ADVERSE CONDITIONS

### 11–13. Desert

*a. Sand and Dust.* The chief maintenance problems in desert operations are caused by sand and dust. When aircraft land and take off, sand and dust are drawn into running engines. These particles act as abrasives on internal parts and adhere to lubricated parts, causing excessive wear. Transparent materials such as plastic windows are pitted by blowing sand, resulting in reduced visibility.

*b. Minimizing Damage.* To minimize damage caused by extreme heat, sand, and dust—

(1) Maintenance sites must be selected on the hardest ground available.

(2) Engine runup test stands should be on concrete, if possible; if not, over a pit filled with rocks or a surface covered with tarpaulins.

(3) Landings and takeoffs should be made near mooring points to reduce taxying.

(4) Engines will not be operated at high speeds over loose sand.

(5) Engine openings will be covered as soon as the engine is stopped.

(6) Oil servicing equipment will be kept in a covered, compact box to keep the equipment free from sand.

(7) Air filters will be inspected often. A clean, extra filter must be available for change during field stops.

(8) Engines must be cleaned daily.

(9) Control cable tension must be checked closely. Aircraft structural materials will expand more than cables in extreme heat, thus tightening the cables.

(10) Pressure in oleo struts must be checked to prevent damage to hydraulic seals.

(11) The compass fluid level must be checked often.

(12) When starting the engine, *under*prime rather than overprime; increase amount of prime as needed.

(13) To prevent seizure, parking brakes must not be applied until brakes have cooled.

(14) Aircraft should be parked in the shade, and loose rather than tight covers must be used to protect Plexiglas from damage.

(15) A close check will be kept on oil consumption to alert maintenance personnel for possible engine change when oil consumption exceeds normal.

*Note.* TM 1–2R–1–15 will be referred to before removing an aircraft engine because of excess oil consumption.

*c. Field Expedients.*

(1) Helicopter tail rotor leading edges may be damaged by sand. To minimize damage, cover the leading edges with cloth-backed tape cut in equal lengths (to preserve balance). Change when necessary.

(2) To protect control linkage, especially the tail rotor pitch change links from sand, cover with chamois secured with safety wire. *Do not impede normal movement of the parts.* This linkage should be inspected regularly to insure that sand is not getting inside the covering.

## 11–14. Jungle

*a. General.* All precautions used in desert operations should be followed in jungle operations. The high humidity in jungle

areas creates additional maintenance problems. All equipment directly exposed to the weather may be damaged by the hot, humid climate and requires additional care.

*b. Fungus.* To prevent fungus damage to electronic equipment, procedures specified in appropriate equipment technical manuals should be followed when applicable. Fungus growths start rapidly on all wood and fabric parts of an aircraft and can be detected only by constant inspection of all portions of the aircraft. This growth will weaken and rot spars and other structural members. Material on which fungus is found must be closely examined to prevent structural failure in flight.

*c. Rust.* High humidity will cause metal parts to corrode quickly. A coating of grease affords some protection; however, the grease must be constantly inspected and replaced to prevent adherence of dust particles to the surface, with consequent wear of the part.

*d. Tire Wear.* Rock and coral surfaces increase tire wear.

## 11–15. Arctic

*a. General.* Low temperatures in the Arctic require special practices and maintenance techniques for efficient aircraft operation. Special equipment is required both for the aircraft and for those performing maintenance upon it. In addition to the particular procedures described in *b* through *h* below, the following must be habitually practiced:

(1) Before flight, snow and ice must be removed from aircraft surfaces. Only authorized deicing equipment will be used.

(2) Moving parts must be lubricated with lubricants recommended for temperatures existing in the operational area.

(3) Before starting engine, heat must be applied to engine(s), instruments, and accessories.

(4) The oil dilution system must be used to aid engine starting.

(5) Maintenance personnel must wear gloves when working on parts of the aircraft or metal materials which are below freezing.

(6) Work shelters must be provided for maintenance personnel.

(7) Protective covering must be provided for the engine, propeller, and other portions of the aircraft.

(8) Exposed portions of shock struts must be free of ice and properly lubricated with hydraulic fluid at all times.

(9) Frost must not be scraped from Plexiglas surfaces.

Alcohol should be used to remove the light film of frost formed during engine warmup.

*b. Preheater.* A standard combustion-type portable preheater is issued in cold climates. It is used to heat the maintenance tents and working areas, and to—

(1) Apply heat to the engine accessory case, carburetor, induction system, and oil sump before starting engine.

(2) Melt ice under protective aircraft covers before their removal. Heat may be applied directly to the frozen area or to the entire wing through the wing inspection plates.

*Note.* Protective covers must be thoroughly dry when not in use and must be stored in a warm, dry place.

(3) Apply heat to selected areas of the aircraft to permit mechanics to work without gloves for reasonable periods of time.

*c. Preflight Preparations.* In preflight preparations, determine that—

(1) Adequate survival gear is aboard the aircraft.

(2) Flight controls are not frozen or jammed with ice.

(3) Wing surfaces are free of snow and ice. Takeoff will not be attempted until wings are clean.

(4) Hydraulic brake lines are not cracked or broken.

(5) Fuel tank vents and oil breathers are free of ice.

*d. Engine Starting and Warmup.* When starting engines in low temperatures, include these precautions:

(1) Use auxiliary power unit (APU).

(2) Use oil dilution during engine warmup to prevent excessive oil pressure.

(3) Use carburetor heat only when required for fuel vaporization.

(4) Use additional traction materials on an icy surface to prevent sliding of wheels, skis, and/or chocks.

(5) Allow 5 to 10 minutes between unsuccessful starting attempts. At times, removal of one spark plug from each cylinder and applying heat to rid it of ice accumulated during starting attempts will be necessary.

(6) Thirty seconds after starting engine, if oil pressure is not indicated, stop engine immediately and apply heat to oil transmitter line and oil feed line if congealed oil is suspected.

(7) If oil foam seeps from crankcase breather, reduce engine rpm.

(8) Adjust engine rpm to insure generator operation.

(9) Never turn on radios or electrical equipment until generator is operating; use an APU.

(10) Check suction gage after starting to ascertain that drive shaft of vacuum pump has not sheared.

(11) Use primer as needed to assure a smooth-running warm-up.

*e. Postflight.* To lessen condensation of moisture in fuel tanks, the tanks must be filled, through an appropriate filter, immediately after flight and before aircraft is parked for the night. If aircraft are not equipped with oil dilution systems, engines having a self-contained oil supply can be drained at the end of the day's operation and the oil heated prior to replacing in the engine. In addition, the following procedures are used:

(1) Shock struts will be cleaned and lubricated with hydraulic fluid.

(2) Sumps will be drained of water accumulations.

(3) The engine will be operated at low rpm to cool it prior to dilution of oil and shutdown. Premature shutdown causes improper oil dilution and may cause the pistons to seize in the cylinders.

(4) Stressed parts will be examined carefully. (Metal becomes brittle in cold temperatures.)

(5) Aircraft batteries will be removed, when not in use, and stored in a warm place.

(6) Survival gear should be removed from the aircraft.

(7) Protective covers will be wrapped securely around the engine at night.

(8) To prevent the carburetor butterfly valve from freezing in the closed position, the throttle will be left partially open after stopping the engine.

*f. Parking or Mooring.* While parking or mooring aircraft, these precautions should be followed:

(1) Layers of paper, rags, straw, brush, or other insulating material should be placed under tires or skis.

(2) Spoilers, when available, should be used on wings.

(3) After taxying through slush or water, parking brakes should be released to prevent freezing in the braked position.

(4) To prevent frost formation on windshield and windows, one window should be left partially open to equalize inside temperatures with that outside.

(5) Aircraft will always be moored. If permanent mooring rings are not available, ice bridges may be constructed to secure the mooring ropes, or the "dead man" method of mooring (FM 31–70) may be used.

*g. Field Expedients.*

(1) Snow and frost may be removed from aircraft surfaces with a broom or by pulling a rope fore and aft over the wings while moving it spanwise in a sawing motion. ***Caution:*** **Care must be exercised to prevent damaging the pitot head.**

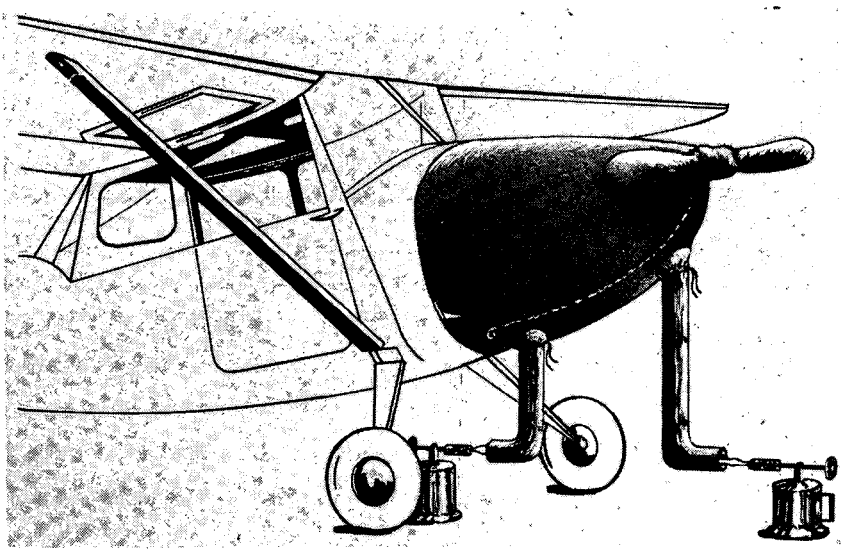


*Figure 11–2. Preheating with blowtorches.*

(2) An aircraft engine may be preheated adequately by using blowtorches, lengths of stove pipe, stove pipe elbows, and an engine protective cover (fig. 11–2).

(3) Engines may also be preheated by using a plumber's fire pot, an empty 5-gallon can with one end removed, and a large piece of canvas for an engine cover (fig. 11–3). This system provides warmth under the canvas for maintenance personnel while the engine is preheating. WARNING: Beware of carbon monoxide poisoning when using this method.

***Caution:*** **In cold weather operations, fire is a potential hazard. In any method of engine preheating, a fire extinguisher must be available.**

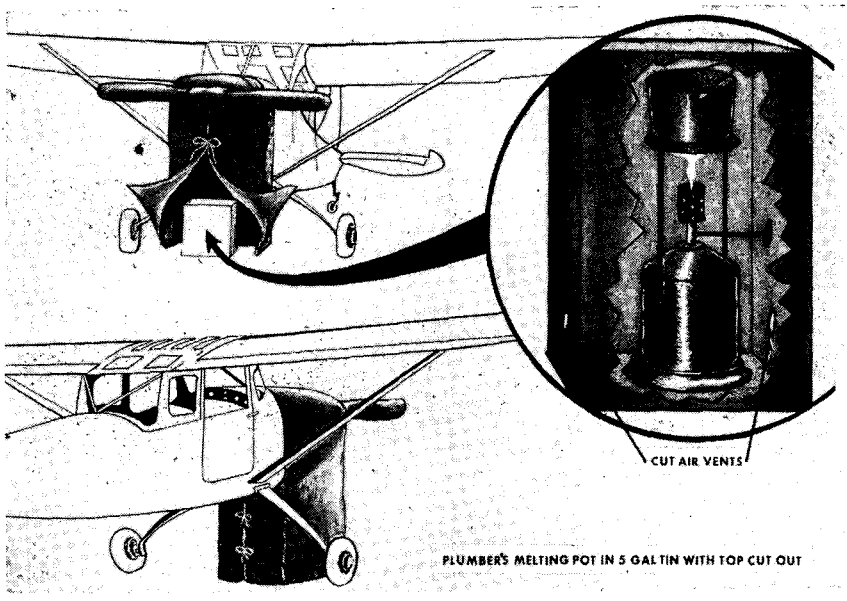



*Figure 11–3. Preheating with a plumber's pot.*

*h. Further Precautions.*

(1) If the aircraft is not equipped with an oil dilution system, ground run the engine at short intervals.

(2) If oil or fuel is accidentally spilled on clothing, move to a heated shelter and remain there until oil has been removed or the spilled fuel has evaporated.

(3) To maintain proper operating temperatures, install standard winterization equipment on aircraft, and baffles on the oil cooler.

(4) After the aircraft is aloft and operating temperatures have adjusted, test the flow of fuel from all tanks before leaving the vicinity of the field.

(5) Torque all bolts to minimum tolerances. As the engine heats, expansion will seal minor oil leaks.

(6) When taxying, watch for obstacles obscured by snow.

(7) Taxi slowly and carefully, using power as necessary. Use brakes sparingly.

(8) Since taxying will cause engine to cool, insure that engine is at operating temperature before takeoff.

(9) Apply pitot heat while taxying to insure that pitot static head will function.

(10) When there is a temperature inversion, expect a sudden frosting of the windshield while climbing from the field.

(11) Vacuum-operated instruments may be unreliable due to bearing drag caused by congealed instrument lubricants.

(12) Operate flaps several times after takeoff to keep them from freezing in the up position.

(13) With propeller pitch control reduce engine rpm 300 below cruise every 30 minutes to preclude oil congealing in propeller cylinder or pitch change motors.

(14) Expect the magnetic compass to be unreliable at such close proximity to the North Pole.

(15) When ice has formed on the aircraft, approach and land at a higher airspeed than normal.

(16) When landing on clean snow, judge height above the ground by reference to surrounding obstacles.

(17) Use brakes with extreme caution. When brakes are applied, snow may build up ahead of the wheels, causing aircraft to nose over.

(18) To avert engine failure in event of a go-around, maintain operating oil and cylinder head temperatures during descent.

(19) Be alert to the danger of static electricity built up on the bodies and clothing of servicing personnel. Have them drain off static electricity by touching metal surface of aircraft with bare hands before fueling.

(20) Be alert for fuel with a lower octane rating than that marked. Octane is sometimes lowered due to deterioration in long storage.

## 11–16. Mountain or High Altitude Conditions

*a. General.* The altitudes involved in mountain flying generally require climb and cruise at full throttle, which causes engine strain and a general loss of engine efficiency.

*b. Condensation.* Since condensation results from rapid changes in temperature, fuel must be closely checked for water content, sumps drained often, and fuel tanks kept as full as possible.

*c. Expansion.* Because liquids expand at higher altitudes, both engine oil and hydraulic fluid must be kept at a lower than normal level.

*d. Routes of Communication.* Since routes of communication may limit supply, major maintenance should be accomplished in rear areas where necessary parts and equipment are available.

## 11–17. Salt Air

In the vicinity of salt water, corrosion of aircraft metal parts

must be controlled by painting or coating with a corrosion-preventive compound (paralketone or equivalent). Every inspection will include detailed inspection of all metal aircraft parts and corrective maintenance to control rust and corrosion.

*a.* Aircraft operating over or near salt water must be washed with fresh water after each flight.

*b.* Fixed wing aircraft propellers must be wiped with a coat of light oil during every postflight.

*c.* Adequate protective finishes must be maintained on magnesium. Normally corrosion does not form on painted or protected surfaces, but bare magnesium alloys exposed to salt air will corrode rapidly. Affected areas are characterized by—

(1) Blistering or cracking of the finish coating.

(2) A white, powdered appearance.

(3) Zinc chromate primer discoloration.

*d.* Although aluminum surfaces do not show evidence of corrosion if coated with a protective finish, corrosion will result from moisture permeating the paint and attacking the metal. Affected areas will generally be characterized by—

(1) A scaly or blistered appearance of the finish.

(2) A dulling and pitting of the area.

(3) Whitish or reddish powdered deposits.

*e.* To differentiate between aluminum and magnesium alloys, apply one drop of ordinary battery acid to the surface of the metal being tested. On aluminum no immediate reaction will occur; on magnesium the area will immediately show a foaming or boiling action, with black discoloration. *The tested area will be washed with water immediately to prevent flesh burns to personnel and continued acid reaction with the metal.*

## 11–18. Hurricanes

AR 95–87 covers the evacuation of Army aircraft that are based in a hurricane zone. Those aircraft that cannot be evacuated must be headed into the wind and protected by other special precautions as indicated in *a* and *b* below.

*a. Spoilers.* Spoilers, which are used to spoil the flow of air over the wing surfaces, may be constructed from 2- by 4-inch lumber and padded to protect the aircraft surface. Best results are obtained when spoilers are lashed to the top of wing surfaces about 12 inches behind the leading edge.

*b. Other Precautions.* Trucks with tarpaulins, strategically placed around the aircraft, will provide protection from flying debris and break the force of the wind.

## 11–19. Mooring

*a. Method.* The ground anchorage for aircraft mooring ropes will be at least 3 feet forward and 3 feet outboard of the wing mooring rings. The rear anchorage will be at least 2 feet back of the rear mooring ring. Two hemp or nylon ropes, at least one-half inch in diameter, will be used. These ropes must be inspected frequently for signs of wear. Tiedown ropes must be tied to allow for shrinkage due to moisture; knots must be secure but of a type easily untied. Two half-hitches in the mooring ring, with the loose end of the rope secured, is the normal technique. Chocks, wheel boxes, or wheel holes must be provided to restrict the aircraft; all control surfaces must be locked.

*b. Field Expedients.*

(1) If the aircraft is in a narea where no tiedown facilities are available, a 55-gallon drum filled with water and tied under each wing may be used as a temporary tiedown.

(2) When hail is expected, aircraft must be covered.

# APPENDIX I
# REFERENCES

## 1. Army Regulations

| | |
|---|---|
| AR 11–8 | Logistic Policies and Priorities (U). |
| AR 95–13 | Safety Procedures for Operation and Movement of Army Aircraft on the Ground. |
| AR 95–87 | Aircraft Hurricane Evacuation. |
| AR 220–10 | Preparation for Oversea Movement of Units (POM). |
| AR 220–50 | Regiments—General Provisions. |
| AR 220–60 | Battalion, Battle Groups, Squadrons; General Provisions. |
| AR 220–70 | Companies; General Provisions. |
| AR 310–1 | General Policies. |
| AR 310–2 | Department of the Army Publications Media, Numbering, and Distribution. |
| AR 320–5 | Dictionary of United States Army Terms. |
| AR 320–50 | Authorized Abbreviations and Brevity Codes. |
| AR 380–5 | Safeguarding Defense Information. |
| AR 385-series | (Safety.) |
| AR 611–201 | Manual of Enlisted Military Occupational Specialties. |
| AR 700–18 | Repair Parts Allocation and Allowances. |
| AR 700–38 | Unsatisfactory Equipment Report (Reports Control Symbol CSGLD–247 (R2)). |
| AR 700–41 | Unsatisfactory Report (Reports Control Symbol TC–208). |
| AR 700–1500–2 | Preparation and Processing of DD Form 780-series (Aircraft Inventory Records). |
| AR 700–2800–2 | Installed and Spare Aircraft Engines (Reports Control Symbol TC–174). |
| AR 710–1500–8 | Army Aircraft Inventory, Status, and Flying Time. |
| AR 711–10 | Supply Economy. |
| AR 711–16 | Installation Stock Control and Supply Procedures. |
| AR 715–30 | Local and Regional Purchase of Civilian Type Items. |

| | |
|---|---|
| AR 725–5 | Preparation, Processing, and Documentation for Requisitioning, Shipping, and Receiving. |
| AR 725–750 | Transportation Corps Sources of Supply. |
| AR 735–11 | Accounting for Lost, Damaged and Destroyed Property. |
| AR 735–35 | Supply Procedures for TOE Units, Organizations, and Non-TOE Activities. |
| AR 740–15 | Preservation, Packaging and Packing. |
| AR 743–41 | Shed and Open Storage of Supplies. |
| AR 750–1 | Concept of Maintenance. |
| AR 750–5 | Maintenance Responsibilities and Shop Operation. |
| AR 750–6 | Maintenance Planning, Allocation and Coordination. |
| AR 750–8 | Command Maintenance Inspections. |
| AR 750–50 | Use of Controlled Cannibalization as a Source of Low Mortality Repair Parts Supply. |
| AR 750–214 | Aircraft Field Maintenance Shops Assistance to Supported Units. |
| AR 750–707 | Transportation Corps Technical Assistance Program. |
| AR 750–712 | Modification of Army Aircraft and Transportation Air Items. |
| AR 750–725 | Maintenance Inspections and Reports Transportation Corps Equipment. |
| AR 750–770 | Transportation Corps Field Maintenance Shops and Missions. |
| AR 750–1500–8 | Use of Serviceable Parts from Unserviceable Aircraft or Aircraft Components. |
| AR 755–6 | Reporting of Station and Technical Service Excess Personal Property. |

### 2. Field Manuals

| | |
|---|---|
| FM 1–100 | Army Aviation. |
| FM 21–5 | Military Training. |
| FM 21–6 | Techniques of Military Instruction. |
| FM 21–30 | Military Symbols. |
| FM 31–70 | Basic Cold Weather Manual. |

### 3. Technical Manuals

| | |
|---|---|
| TM 1-series | (Aviation.) |
| TM 9–2810 | Tactical Motor Vehicle Preventative Maintenance, Supply, Inspection, and Training Procedures. |
| TM 55-series | Aircraft Instruction Manuals. |

| | |
|---|---|
| TM 55–403 | Fundamentals of Army Helicopter Maintenance. |
| TM 55–404 | Fundamentals of Army Airplane Maintenance. |
| TM 743–200 | Storage and Materials Handling. |

### 4. Department of the Army Pamphlets

| | |
|---|---|
| DA Pam 20–21 | The Army School Catalog. |
| DA Pam 108–1 | Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings. |
| DA Pam 310-series. | Military Publications Indexes. |

### 5. Supply Bulletins

| | |
|---|---|
| SB 1–15-series | (Aviation Supply Bulletins.) |
| SB 55–28 | Issue of Supplies and Equipment: Transportation Regulated Items. |
| SB 708–401 | Federal Supply Classification; Part 1, Groups and Classes (Cataloging Handbook H 2–1). |

### 6. Technical Bulletins

| | |
|---|---|
| TB AVN 5 | Preparation and Processing of DD Form 781, "Aircraft Flight Report and Maintenance Record." |

### 7. Supply Manuals

| | |
|---|---|
| SM 55-series | (Transportation.) |

# APPENDIX II
# SAMPLE GUIDE: MAINTENANCE STANDING OPERATING PROCEDURES

(Organization)

(Station)

STANDING OPERATING PROCEDURE (Date)_____

NUMBER_____

TABLE OF CONTENTS

* * * * * * *

## Section I. GENERAL

1. *Scope.* The procedures covered herein pertain and apply to maintenance activities for the company.

2. *Changes.* Published by senior headquarters only. Recommended changes, deletions, and corrections should be reported through command channels.

3. *Distribution.* To all personnel concerned with aircraft maintenance.

4. *Posting.* Accessible to all personnel. Required reading is preferred.

## Section II. REFERENCES

5. *Army Regulations.* (Listed by number, subject, and date.)

6. *Department of the Army Circulars, Technical Manuals, Memorandums, and Directives from Higher Headquarters.* (Listed in numerical and alphabetical sequence.)

7. *Field Manuals.* (Listed by number and paragraph.)

8. *Company Directives.* (Include all subjects considered by the senior commander to be important.)

## Section III. ORGANIZATION AND OPERATION OF THE MAINTENANCE PLATOON

9. *Staff Responsibility.*
   *a.* Maintenance officer.
   *b.* Assistant maintenance officer.
   *c.* Repair supervisor.
   *d.* Platoon sergeant.
   *e.* Airfield service section NCO.
10. *Interior Arrangement, Garrison.*
   *a.* Inspections.
   *b.* Local security.
   *c.* Police responsibility.
   *d.* Tiedown area.
11. *Interior Arrangement, Field.*
   *a.* Inspections.
   *b.* Local security.
   *c.* Police responsibility.
   *d.* Tiedown area and camouflage.

## Section IV. RULES AND REGULATIONS

12. *Army Regulations on Ground Handling of Equipment.*
13. *Local Directives on Control of Aircraft.*

## Section V. RECORDS AND REPORTS

14. *Records.* (Include all administrative information necessary to maintain accurate and complete records.)

*a.* Aircraft Inventory Record—Equipment List (DD Form 780–1).

*b.* Aircraft Inventory Record—Shortages (DD Form 780–2).

*c.* Aircraft Inventory Record—Certification and Record of Transfers (DD Form 780–3).

*d.* Aircraft Flight Report and Maintenance Record—Aircraft Flight Report (DD Form 781–1).

*e.* Aircraft Flight Report and Maintenance Record—Aircraft Inspection and Maintenance (DD Form 781–2).

*f.* Aircraft Flight Report and Maintenance Record—Delayed Correction Discrepancy List (DD Form 781–3).

*g.* Aircraft Flight Report and Maintenance Record—Aircraft General Data (DD Form 781–4).

*h.* Aircraft Flight and Maintenance Record—Accessories Data (DD Form 781–5).

*i.* Aircraft Flight Report and Maintenance Record—Aircraft Summary (DD Form 781–6).

*j.* Historical Record for Aeronautical Equipment (DD Form 829).

*k.* Historical Record—Technical Instruction Compliance (DD Form 829–1).

*l.* Historical Record—Significant Historical Data (DD Form 829–2).

*m.* Work Request and Job Order (DA Form 811).

15. *Reports.* (Include information necessary to meet local requirements.)

*a.* Unsatisfactory Report (DD Form 1275).

*b.* Unsatisfactory Equipment Report (DA Form 468).

*c.* Army Aircraft Inventory, Status, and Flying Time (DA Form 1352).

*d.* Installed and Spare Aircraft Engines (DA Form 1890).

## Section VI. SHOP OPERATION AND SAFETY REGULATIONS

16. *Shop Operations.*

*a.* Performance of scheduled services.
- (1) Responsibility.
- (2) Procedure.
- (3) Retention of records.

*b.* Emergency services.
- (1) Crew responsibility.
- (2) Maintenance platoon repair.
- (3) Emergency higher-echelon repair.
- (4) Liaison with field maintenance.

*c.* Preparation of aircraft for evacuation and/or storage.

17. *Inspection Procedure.*

*a.* Spot check and unit inspectors.

*b.* Organizational inspection procedure.

18. *Safety Regulations.*

*a.* Taxying of aircraft.

*b.* Operation of vehicles.

*c.* Towing of aircraft.

*d.* Storage of flammable material.

*e.* Fire plan.

*f.* Alert or emergency evacuation plan.

*g.* High wind and storm procedures.

*h.* Report of accidents and accident records.
- (1) Aircraft accidents.
- (2) Vehicle accidents.

## Section VII. SUPPLY PROCEDURE AND SUPPLY RECORDS

19. *Staff Responsibilities for Supply.*
20. *Requisitioning of Repair Parts.*
21. *Turn-in of Salvage and Excess Material.*
22. *Requisitioning Schedules.*
23. *Issue Procedures.*
24. *Petroleum, Oils, Lubricants (POL) Procedures.*

## Section VIII. BATTLEFIELD RECOVERY AND EVACUATION PLAN (NUCLEAR AND NONNUCLEAR)

25. *Recovery and Evacuation.*
26. *Use of Field Maintenance Support.*

## Section IX. LOADING PLANS

27. *Rail.*
28. *Water.*
29. *Air.*

* * * * * * *

# APPENDIX III
# INSPECTION GUIDES FOR ORGANIZATIONAL MAINTENANCE AND SUPPLY

*Note.* These inspection guides will assist the organizational maintenance officer in performing inspections. They are not intended to be regulatory and may be modified as required.

## I. MAINTENANCE OPERATION TECHNICAL INSPECTION GUIDE

### Section I. GENERAL

1. Are maintenance records and facilities properly located in relation to each other and to the flight line? To the technical supply?

2. Is there a planned maintenance program actively supervised and controlled by a qualified maintenance officer?

3. Is the technical supply officer responsible to the maintenance officer?

4. Are necessary tools and repair parts for aircraft on hand and properly maintained?

5. Are working areas policed and free of safety hazards?

6. Are maintenance personnel properly supervised?

7. Are unauthorized tools and equipment on hand?

8. Does completed maintenance on aircraft undergo technical inspection prior to its release for flight?

9. Is there a clearcut SOP in effect between the mechanics and technical supply?

10. Is lateral transfer of parts controlled?

11. Is there a suitable area set aside for maintenance personnel to work on records, study technical manuals, etc.?

12. Is the maintenance office set up in an orderly manner with the required charts, files, technical manuals, etc., arranged for the most efficient utilization?

13. Other?

## Section II. ACCESSORY REPLACEMENTS

14. Are scheduled accessory replacements made at the nearest scheduled inspection time?

15. Are accessories ordered in advance as specified in the maintenance SOP?

16. Is proper procedure being used when accessory replacement time is extended?

17. Is the accessory replacement chart correctly prepared and does it include all required items?

18. Are circled replacement times backed up by parts request slips or a letter of notification to the field maintenance activity?

19. Do the replacement times shown agree with those in DD Form 781–5?

20. Is the "Aircraft hours to date" column kept current?

21. Is the accessory replacement time circled when the accessory has been ordered?

22. Is the field maintenance activity properly notified of accessory changes for which they will be responsible as required in the maintenance SOP?

23. Other?

## Section III. ARMY AIRCRAFT INVENTORY, STATUS, AND FLYING TIME REPORT (DA FORM 1352)

24. Are all blocks of the heading properly filled out?

25. Are the authorized aircraft listed by category?

26. Does Column C show a code for each aircraft?

27. Does Column D reflect the correct number of accountable days?

28. Does Column D equal the sum of Columns E and F?

29. Does Column F equal the sum of Columns G, H, I, and K?

30. Are entries in Column K properly designated by applicable code?

31. Are entries in Column H properly designated by applicable code?

32. Is the aircraft daily status chart correctly prepared and utilized as required?

33. Other?

## Section IV. MAINTENANCE FILES

34. Are files neatly arranged and properly identified?

35. Are DD Form 781–2's for the current month filed in a separate folder?

36. Are the current DD Forms 781–4 and –5 for each aircraft filed with the historical records for that aircraft?

37. Are the DD Forms 781–2, –3, –4, and –5 for the previous month bound together with the required cover sheet?

38. Are the DD Forms 781–2, –3, –4, and –5 for the previous 6 months filed in a single folder?

39. Is a work request file maintained, with completed work orders separated from those in suspense?

40. Are the loose equipment checklists filed for those aircraft in field maintenance?

41. Is a UR file maintained?

42. Is a file of Army Aircraft Inventory, Status, and Flying Time Reports maintained?

43. Are maintenance directives, memoranda, etc., properly filed for easy reference?

44. Are duplicate copies of parts request slips, with supply action indicated, kept for each aircraft?

45. Is the aircraft G file, less the maintenance records, complete and filed in a suitable location?

46. Other?

## Section V. AIRCRAFT STATUS

47. Is a record of the current aircraft maintenance status kept as indicated in section V of the maintenance SOP or by an equally efficient system?

48. Is the following information reflected: Total aircraft hours, next inspection due, aircraft hours next inspection due, hours remaining to next inspection, date and reason aircraft is grounded?

49. Is all information accurate and current?

50. Other?

## Section VI. TECHNICAL MANUALS

51. Are technical manuals on hand and filed?

52. Are required technical manuals on hand or on requisition?

53. Is a technical manual familiarization system effectively used?

54. Are changes properly inserted?

55. Is follow-up action taken when requisitioning is ineffective?

56. Other?

# II. RECONNAISSANCE HELICOPTER TECHNICAL INSPECTION GUIDE

The following items will be inspected:

## Section I. ENGINE GROUP

1. Engine upper and lower mount assemblies for cracks, wear, and security.

2. Engine frame assemblies for cracks and security.

3. Engine sprag or snubber system tubes and connecting links for damage, and lord mounts for cracking and deterioration.

4. Cooling shroud for cracks, rips, and security.

5. Fan assembly for security of mounting, loose rivets, belts for serviceability, gear box for leaks, and couplings for security and wear.

6. Baffles for condition and security.

7. Intake manifolds for leaks, defective gaskets, and broken or insecure mounting studs.

8. Carburetor for leaks and security of controls.

9. Exhaust manifolds for broken studs, loose nuts, leaks, or cracks.

10. Ignition cables for chafing, sharp bends, and security.

11. Spark plugs, terminals, and shielding for looseness.

12. Carburetor inlet or screen for dirt and safetying.

13. Carburetor heater, airscoop, and cabin heater for looseness or damage.

14. Starter, generator, tachgenerator, and magnetos for loose terminals, broken mounting bolts, studs, or nuts.

15. Starter for oil leak or corrosion.

16. Oil cooler for dirt and safetying.

17. Oil sump for cracks, damage, leaks, and security.

18. Oil lines for kinks, damage, leaks, coding, and security.

19. Engine for leaks, dirt, and missing bolts or studs.

20. Engine controls linkage for excessive play, cracks, safetying, and failure to hit stops.

21. Throttle correlation for adjustment, damage, and security.

22. Push rod housing for dents, cracks, and leakage.

23. Cylinders for cracked fins and security of hold-down nuts.

24. Rocker box covers for cracks, leaks, and security.

25. Main gear box for leaks, cracks, damage, and security of attachments.

26. Clutch for leaks and indication of overheating.

27. Miscellaneous.

## Section II. FUEL GROUP

28. Fuel tank support brackets for security, cracks, damage, and corrosion.

29. Access door for cracks and security.

30. Fuel tank for security, leaks, and damage.

31. Fuel and vent lines for leaks, chafing, cracks, and bonding.

32. Fuel strainer and drain valve for security, leakage, and cleanliness.

33. Fuel shutoff control operating linkage for wear and security.

34. Fuel tank drain valves for operation and corrosion.

35. Fuel quantity transmitter for leakage and security of electrical terminals.

36. Miscellaneous.

## Section III. FLIGHT CONTROL GROUP

37. Cyclic control for stick or linkage binds, chafing, and security.

38. Collective pitch for stick or linkage binds, chafing and security.

39. Push-pull rods for bends, cracks, loose or missing rivets.

40. Rod ends for proper lubrication, looseness, or binding.

41. Torque tubes for cracks, wear, and security.

42. Bell cranks for cracks, wear, and security.

43. Hydraulic boost system control valve for operation, leakage, and security; actuating rod for operation and security.

44. Actuating cylinders, support brackets, and bushings for freedom of operation, leakage, bending, corrosion, cracks, and wear.

45. Hydraulic reservoir for cracks, leakage, specified fluid level, corrosion, and security.

46. Reservoir vent filter for leakage, corrosion, and security.

47. Hydraulic filter for leakage, corrosion, and security.

48. Hydraulic lines, hose, and fittings for leakage, chafing, damage, and security.

49. Synchronized elevator, forward control support idler bracket, torque rod, and lever assembly for proper operation, freedom of movement, cracks, corrosion, and security.

50. Damper assembly for wear and security.

51. Swash or wobble plate for cracks, excessive wear, and security.

52. Collective pitch boot for security and wear.

53. Control stabilizer bar for bends, looseness, or damage; mixing levers and linkage for wear and security.

54. Scissors for binding and security.

55. Damper (stabilizer) assemblies for defective operation, leakage, and security.

56. Miscellaneous.

## Section IV. ROTOR HEAD AND BLADE GROUP

57. Dynamic stop cables for damage and proper adjustment.

58. Static stops for damage and excessive wear.

59. Gimbal ring for freedom of movement, damage, and security.

60. Yoke assembly for freedom of movement, damage, and security.

61. Equalizer beam and links for bends, cracks, and safetying.

62. Scissors bearings for freedom of movement, excessive play of bearing joints, and security.

63. Main rotor hub for damage, cracks, and freedom of movement.

64. Main rotor retaining nut for security.

65. Drag brace attaching bolts and jam nuts for cracks and security.

66. Main rotor roots for deterioration or damage to sealing, corrosion, security of fittings, and cracks in excess of allowable limits.

67. Blade grips for freedom of movement, cracks, and security.

68. Main rotor blade for abrasion of Fiberglas covering, especially the outboard edge of face plate and inboard edge of the Fiberglas.

69. Main rotor blade leading edge for cracks, dents, and security.

70. Main rotor blade trim tab for cracks, damage, and security.

71. Control rotor blades for damaged fabric cover.

72. Protective coating for cracks or peeling.

73. Miscellaneous.

## Section V. LANDING GEAR GROUP

74. Skid crosstubes for damage and security.

75. Skids for damage and security; skid shoes for wear.

76. Dolly tires for correct inflation, cuts, blisters, and slippage marks.

77. Miscellaneous.

## Section VI. TAILBOOM GROUP

78. Boom attachment fittings for security, cracks, and alignment.

79. Universals for wear, binding, proper lubrication, and security.

80. Shafts for bends, damage, or loose rivets and caps.

81. Shaft hangars for looseness, cracks, alignment, and security.

82. Cardan housing for cracks and security.

83. Control cables for cleanliness, fraying, and tension.

84. Cable fairleads and pulleys for alignment, cracks, wear, and security.

85. Battery for mounting and security.

86. Battery for low electrolyte, worn cables, corrosion, and capacity check date.

87. Stabilizer fin for cracks, dents, and adjustment.

88. Tail skid for cracks, alignment, and security.

89. Pitch-change drum for cracks and security.

90. Tail rotor gear box for proper lubrication, scored drive shaft, and security.

91. Tail rotor hub for cracks, pitch-change linkage binds, and security.

92. Tail rotor blades for warpage, cracks, dents, deep scratches, loose or missing rivets, and protective coating.

93. Yoke and blade grip for cracks and security.

94. Tapered pins for security.

95. Miscellaneous.

## Section VII. AIRFRAME GROUP

96. Fuselage (frame) structure for cracks or damage.

97. Fuselage surface for cracks, dents, and loose or missing rivets.

98. Litter equipment for condition and security.

99. Firewall for cracks, corrosion, or missing rivets.

100. Inspection doors for cracks and loose or missing fasteners.

101. Insignia, stencils, placards, and decals for legibility.

102. Position lights for operation, cracked lens, and missing bulbs.

103. Landing light for operation, cracked lens, and security.

104. Aircraft interior and exterior for cleanliness.

105. Miscellaneous.

## Section VIII. CABIN COCKPIT GROUP

106. Cabin enclosure for cracks, scratches, transparency, and security.

107. Doors for cracks and security.

108. Emergency releases for defects.

109. Seat cushions for damage and security.

110. Safety belts and shoulder harnesses for freedom of operation, security, and date of last weight test.

111. Inertia cables for fraying and operation of locks.

112. First aid kit for broken seal, presence of serviceability tag, and last inspection date.

113. Instruments for looseness, broken or dirty glass, markings, and security.

114. Instrument lines or connections for looseness, wear, kinks, and security.

115. Instrument panel for mounting and shielding.

116. Toggle switches for operation.

117. Quadrant controls for cushions and friction-adjusting device for operation.

118. Fuel shutoff for binds.

119. Cabin and instrument lights for operation.

120. Fire extinguisher for mounting, broken seal, or low pressure.

121. Friction locks for binds or lost motion.

122. Trim button for correct movement.

123. Flight controls for full movement, freedom of operation, and lost motion.

124. Rudder pedals for adjustment, cracks, and security.

125. Hydraulic pressure relief valve for proper operation and security.

126. Miscellaneous.

### Section IX. RADIO GROUP

127. Radio equipment for damage and security.

128. Spare fuse holder for specified number of serviceable fuses.

129. Antenna for damage, security, and cracked or broken insulators.

130. Shielding for condition.

131. Interphone system for operation.

132. Miscellaneous.

## III. CARGO AND UTILITY HELICOPTER TECHNICAL INSPECTION GUIDE

The following items will be inspected:

### Section I. ENGINE COMPARTMENTS

1. Engine cowling for dents, cracks, and broken or missing Dzus fasteners.

2. Engine compartment doors for cracks, dents, and security.

3. Fire detector system for damage.

4. Engine for fuel and oil leakage, loose or missing nuts, bolts, studs, and clamps; rocker box covers for leaks and security.

5. Push rod housings for dents, cracks, leakage, and security.

6. Air deflectors and baffles for cracks, security, and rubbing against cylinder fins.

7. Cylinders for cracked fins and security of holddown nuts.

8. Intake manifolds for leakage and broken or insecure mounting studs.

9. Exhaust shrouds and collector for cracks, warping, broken studs, and burning.

10. Ignition cables for chafing.

11. Spark plug, spark plug terminals, and shielding nuts for looseness.

12. Carburetor air filter for contamination and proper servicing.

13. Carburetor for mixture and idle speed adjustment.

14. Carburetor throttle correlation for bent linkage, damage, and operation.

15. Engine control cables, bellcranks, connecting rods, and links for wear, cracks, alignment, damage, and security.

16. Starter, generator, magnetos, tachgenerators, and electrical

connections for security; mounting flange and end housings for cracks, broken or loose studs or nuts.

17. Starting vibrator for damage and security.

18. Fuel pressure transmitter and electrical connections for security and damage.

19. Blast tubes for damage and security.

20. Engine mount for cracks, bent or dented tubes, and security; vibration isolators for deterioration or damage.

21. Oil system, hoses, tubing, and components for leakage, damage, security, chafing, and coding.

22. Oil tank for leakage, chafing, dents, scratches, and security; supporting strap brackets for padding deterioration.

23. Ducts for security, cracks, loose screws, fasteners, or deterioration; filter and air doors for cleanliness and operation.

24. Firewall for cracks, deterioration of seals, and corrosion.

25. Interior fuselage for cracked skin, loose or missing rivets; and structural brackets for cracks or damage.

26. Miscellaneous.

## Section II. FAN COMPARTMENT

27. Interior fuselage for cracked skin, loose or missing rivets; and structural brackets for cracks or damage.

28. Curtain for wear, rips, and security.

29. Hydromechanical clutch for cracks and oil leaks.

30. Stator and/or contravane for cracks, loose rivets, loose or missing nuts and bolts, alignment, scuffing, or burning.

31. Fan assembly and drive shaft adapter for cracks, loose rivets, and security.

32. Inverters and electrical connections for security.

33. Freewheel unit for operation and oil leakage; and rubber boot for deterioration.

34. Miscellaneous.

## Section III. MIDCASE AND/OR ELECTRONIC COMPARTMENT

35. Mounting structure and surrounding structural area for cracks and missing rivets or bolts.

36. Splice bolts for security.

37. Overvoltage field control and starter and battery relay panels for security and operation.

38. Voltage regulator, reverse current relay, and electrical connections for security and mounting.

39. Electrical conduits for damage and loose fittings.

40. Fuel quantity bridge and tank unit for security.

41. Fuel tank and lines for leakage, damage, and coding.

42. Battery for mounting, security, and capacity check date.

43. Battery for electrolyte level.

44. Battery leads and connections for corrosion.

45. Battery container and cover for security.

46. Oil lines for leakage and coding.

47. Transmission for leaks, cracks, and security.

48. Magnetic plug and drain valve for security.

49. Oil temperature bulb and thermo switch leads for security.

50. Rotor tachometer and clutch actuator leads for security.

51. Clutch control cams, cam followers, and actuator linkage for correct position and security.

52. Tanks serviced to specified level, filler caps secured, and overflow tube for security.

53. Bolt retaining clip for security (if cracked, indicates overspeeding of the engine).

54. Oil pressure transmitter for security and mounts for deterioration.

55. Gyrosyn compass transmitter for security and damage to mounting flanges, and dehydrator plugs for serviceability.

56. Miscellaneous.

## Section IV. FORWARD OR MAIN ROTOR FLIGHT CONTROLS

57. Flight controls, bellcranks, torque tubes, cable quadrants, ball and socket joints, connecting rods, rod ends and links for wear, cracks, and alignment; control taper pins for security; and hinges and brackets for cracks, corrosion, and security.

58. Hydraulic flight control actuator for leaks, damage, and security.

59. Hydraulic flight control accumulator for specified air pressure.

60. Central centering spring magnetic brakes for security.

61. Hydraulic lines for kinks, leaks, and coding.

62. Control cables for fraying, turnbuckles for safetying, pulleys for wear and cracks, bearings for binding, and fairleads for alignment and security.

63. Auxiliary flight control hydraulic actuator units for leaks and security.

64. Auxiliary flight control hydraulic system components for security; and tubing for cracks, dents, distortion, and leakage.

65. Upper flight control bellcranks, torque tubes, cable quadrants, ball and socket joints, connecting rods and links for wear, cracks, and alignment; hinges and brackets for cracks, corrosion, and security.

66. Forward collective pitch bungee and bungee bellcrank support structures for damage, corrosion, and cracks.

67. Longitudinal bungee and bungee bellcrank support structures for damage, corrosion, and cracks.

68. Hydraulic pumps for leakage and security.

69. Hydraulic lines for chafing and security.

70. Reservoir for specified fluid level.

71. Reservoir bracket for cracks and security.

72. Pressure relief valve for security, leaks, and damage.

73. Miscellaneous.

## Section V. FORWARD OR MAIN ROTOR AREA

74. Forward mounting steps for cracks, missing springs, dents, etc.

75. Left and right work platforms for damage and security.

76. Fuselage for loose or missing rivets, skin punctures, cracks, and buckled or wrinkled skin.

77. Main gear box oil cooler for leaks, worn pulleys, worn belts, belt tension, and cracked or damaged fan blades.

78. Forward transmission mounting structure and surrounding structural area for cracks, missing rivets, or bolts.

79. Forward gear box torque plates for cracks and condition of mounting lugs.

80. Forward transmission serviced to specified level and filler cap secured.

81. Forward transmission for cracks, leaks, and damage.

82. Forward transmission magnetic plug and drain valve for security.

83. Forward transmission oil lines for damage, leakage, and coding.

84. Forward transmission oil temperature bulb lead and thermoswitch lead for security.

85. Transmission oil pressure transmitter and warning unit vibration isolators for deterioration and damage and mounting brackets for damage and security.

86. Electrical wiring for security and breaks.

87. Miscellaneous.

## Section VI. FORWARD OR MAIN ROTOR HEAD AND BLADES

88. Flap and droop stops for damage.

89. Pitch bearing housing for leaks and security and plastic cups for damage.

90. Rotor hub boot for deterioration.

91. Mast nut for security.

92. Static stops for damage or excessive wear.

93. Main mast for alignment.

94. Rotor dampers for leakage, scored shafts, binding gears, alignment, and oil quantity.

95. Trunnions and guide assemblies for play, galling, and security.

96. Scissors for binding and wear.

97. Star assemblies for cracks, damage, corrosion, and binding.

98. Position of bolt attaching lateral link to universal block head (should be inboard).

99. Trunnion assembly for shouldered bolts and staking of bushings.

100. Upper link attaching bolts for security, bottoming of bolts, and clearance of bushings.

101. Pitch-change links for damage and safetying.

102. Vertical and horizontal pins for security and condition.

103. Rotor blades for dents, cracks, and leading edge separation, and vent openings for obstructions.

104. Blade grips for security.

105. Antiflapping restrainer bushings for binding or excessive play.

106. Miscellaneous.

## Section VII. AFT FLIGHT CONTROLS

107. Flight control cables for binding and chafing; and pulleys for wear, cracks, and security.

108. Rear collective pitch bungee and bungee bellcrank support structures for damage, corrosion, and cracks.

109. Flight controls, bellcranks, torque tubes, cable quadrants, ball and socket joints, connecting rods, rod ends and links for

wear, cracks, and alignment; control taper pins for security; and hinges and brackets for cracks, corrosion, and security.

110. Miscellaneous.

## Section VIII. AFT TRANSMISSION

111. Aft transmission mounting structure and surrounding area for cracks and missing rivets or bolts.

112. Aft gear box torque plates for cracks and condition of mounting lug.

113. Aft transmission serviced to specified level and filler cap secured.

114. Aft transmission for cracks, leaks, and damage.

115. Aft transmission magnetic plug and drain valve for security.

116. Aft transmission oil lines for damage, leakage, and coding.

117. Aft transmission oil temperature bulb lead and thermoswitch lead for security.

118. Transmission oil pressure transmitter, warning unit vibration isolators, and mounting brackets for damage.

119. Electrical wiring for security.

120. Oil system for leakage; and tubing for kinks, cracks, chafing, and security.

121. Oil cooler for damage and security.

122. Miscellaneous.

## Section IX. AFT ROTOR HEAD AND TRANSMISSION

123. Flap and droop stops for damage.

124. Pitch bearing housing for leaks.

125. Mast nut for security.

126. Swash plate for excessive wear and security.

127. Rotor dampers for leaks, scored shafts, binding bearings, and alignment.

128. Scissors for binding and wear.

129. Position of bolt attaching lateral link to universal block head (should be inboard).

130. Trunnion assembly for shouldered bolts and staking of bushings.

131. Trunnion and guide assemblies for play, galling, and security.

132. Upper link attaching bolts for security, bottoming of bolts, and clearance of bushings.

133. Pitch-change links for damage and safetying.

134. Vertical and horizontal pins for security and damage.

135. Rotor blades for dents, cracks, and leading edge separation, and vent openings for obstructions.

136. Miscellaneous.

## Section X. DRIVE SHAFT

137. Drive shaft for proper installation to midcase.

138. Flexible coupling plate assembly for breaks, cracks, dents, and correct installation of washers.

139. Drive shafts for loose balance plates.

140. Shaft support bearings for travel and proper positioning.

141. Grease seals on bearings for excessive leakage.

142. Bearing housing rubber shock mounts for loss of resiliency and security.

143. Flexible coupling plate assembly for breaks, cracks, dents, and correct installation of washers.

144. Universal and splined joints for excessive play, cracks, and proper lubrication.

145. Keys for security at mid and aft transmission adapters.

146. Drive shafts for cracks, nicks, dents, scratches, or other damage.

147. Drive shaft support brackets for cracks, distortion, and security.

148. Miscellaneous.

## Section XI. TAIL CONE

149. Universals for wear, binding, and proper lubrication.

150. Tail rotor guard for damage.

151. Tail rotor drive shaft disconnect coupling for cracks, damage, and security; teeth for wear or damage; and spring for tension.

152. Intermediate gear box for specified oil level, oil leaks, and security.

153. Tail rotor gear box for proper lubricant, scored drive shaft, and security.

154. Tail rotor hub for cracks and pitch change linkage for binding and security.

155. Metal tail rotor blades for dents, scratches, cracks, loose or missing rivets, and proper bonding of pocket assembly to spar.

156. Shaft hangars for looseness, cracks, alignment and security.

157. Shafts for damages.

158. Tail cone attaching bolts for security and attaching clips for cracks and corrosion.

159. Tail rotor control cables for cleanliness, tension, and fraying; turnbuckles for safety; control stops for locking; and chains for wear.

160. Aft directional control, quadrant, rod assembly, bellcrank, and support assembly for cracks, wear, and security.

161. Miscellaneous.

## Section XII. LANDING GEAR GROUP

162. Landing gear components (attaching struts, fittings, etc.) for security, cracks, distortion, and corrosion.

163. Shimmy dampers for security and leakage, arm slot and bearing for cleanliness.

164. Wheel locking device for damage, frayed cables, operation, tension, and security.

165. Nonskid paint for wear.

166. Landing gear shock struts for cracks, distortion, leakage and specified extension; piston for cleanliness, scratches, and damage.

167. Wheels for cracks, rough edges, broken flanges, corrosion, and signs of overheating; flange for distortion; and brake disc for clearance.

168. Wheel retaining nuts for adjustment and safetying.

169. Brake lines and connections for damage, security, and leakage with parking brake ON.

170. Tires for cuts, blisters, wear, inflation, and slippage.

171. Miscellaneous.

## Section XIII. FUSELAGE

172. Fuselage (frame) structure for cracks or other damage.

173. Fuselage skin surfaces for loose or missing rivets, cracks, wrinkles, dents, and abrasions.

174. Inspection panels for cracks, missing or damaged rivets or screws, proper markings, and condition of sealers.

175. Markings or insignia for legibility.

176. Horizontal and vertical stabilizer for loose or missing rivets, punctures, cracks, corrosion, and security.

177. Static ground wire for security and good contact with ground.

178. Main cabin and rescue doors for operation and security.

179. Emergency exit release mechanisms for defects and painting in accordance with TB AVN 7.

180. Main cabin door for corrosion, cracks, loose rivets, and binding; and latching mechanism for damage.

181. Cargo sling for security and proper stowage and fuselage attaching points for structural damage.

182. Cabin rescue door for corrosion, cracks, loose rivets, and binding; latching mechanism for damage.

183. Fuel tanks, pumps, valves, lines or connections for leaks.

184. Fuel and oil tanks filler caps for security.

185. Pitot and static opening for obstruction.

186. Navigation, recognition, landing lights, and searchlights for cracked lenses and operation.

187. Landing light and searchlight control section for security of electrical connections, and electrical conduits for breaks and loose fittings.

188. Miscellaneous.

## Section XIV. COCKPIT GROUP

189. Windshields and windows for crazing, scratches, transparency, security, and proper repairs.

190. Windshield wiper for condition of blade and operation.

191. Nose enclosure frames for corrosion, damage, and security.

192. First aid kit for broken seal and overdue inspection.

193. Relief tube and bracket for damage, security, and deterioration.

194. Heating and defrosting outlets for damage and foreign matter.

195. Compass for correction card and inspection status.

196. Insignia, stencils, placards, and decals for legibility.

197. Wheel lock for operation and security.

198. Brakes for operation, damage, and sponginess.

199. Brake pedals and mechanized linkage for wear and security.

200. Accessible brake lines, hose connections, and components for damage and leaks.

201. Cyclic stick for operation, full travel, lost motion, binding, and security.

202. Control pedals for lost motion, freedom of operation, and security.

203. Collective pitch control down lock and friction lock for operation.

204. Throttle for work linkage, freedom of operation, chafing, and security.

205. Engine controls for cushion, full range of travel, and unrestricted movement; friction adjusting devices for operation.

206. Trim actuator for operation and excessive end play.

207. Hydraulic control shutoff valve for operation.

208. Instrument panels for mounting, cracks, or defective shielding.

209. Instrument and cockpit lights for operation.

210. Instruments for broken or dirty glass, improper markings, and security.

211. Instrument lines or connections for damage.

212. Toggle switches for operation.

213. Fuel selector valve, fuel booster, and transfer pumps for operation and leaks.

214. Circuit breakers for proper operation.

215. Pilot's and copilot's seats and supporting structure for breaks, cracks, and security.

216. Pilot's and copilot's seats for ease of adjustment and positive locking in all positions.

217. Safety belts and shoulder harnesses for bent, damaged, or corroded parts and date of last weight test; fabric and leather for cleanliness, cuts, or fraying.

218. Inertia reel for cracks, corrosion, frayed cable, freedom of operation, and positive locking.

219. Fire extinguisher for pressure and damage and mounting brackets for cracks and security.

220. Miscellaneous.

## Section XV. CABIN COMPARTMENT

221. Cargo hoist, boom, cables, or attachment fittings for wear and security.

222. Hoist system for leaks; lines for cracks, kinks, chafing, scratches; hook for damage; and cable assembly for fraying.

223. Cable cutter for damage and corrosion.

224. Combustion heater fuel lines, hose, and connections for leakage; combustion heater exterior for damage and cracks.

225. Manual heat and ventilating controls for freedom of operation and full range of travel.

226. Air ducts for security, cracks, loose and missing clamps, rivets, or screws, and foreign material in openings.

227. Fire extinguisher for pressure and damage; mounting brackets for cracks.

228. Safety belts and passenger seats for cuts, fraying, and security of attachment; latching parts for freedom of operation and positive locking; date of last weight test.

229. First aid kit for broken seal and overdue inspection.

230. Relief tube and bracket for damage and deterioration.

231. Flooring for security, corrosion, missing rivets and screws; hinges for operation.

232. Soundproofing for rips, cuts, and tears.

233. Electrical conduits for damages, breaks, and loose fittings.

234. Dome lights for cracked lenses and operation.

235. Communication, navigation, and radio components for damage.

236. Litter equipment for condition of security.

237. Miscellaneous.

### Section XVI. RADIO GROUP

238. Loop antenna for damaged loop housing and security.

239. Fixed wire antennas for cracked insulators.

240. Dipole for damaged elements, insulation, corrosion between antenna base and mounting surface, and security.

241. Plugs for proper insertion into jacks and receptacles and junction boxes and covers for damage.

242. Flexible shafts and conduits for broken or crushed casings, breaks, and loose fittings.

243. Shock mounts for cracks, corrosion, security, proper installation, and clearance.

244. Miscellaneous.

## IV. FIXED WING AIRCRAFT TECHNICAL INSPECTION GUIDE

The following items will be inspected:

### Section I. ENGINE GROUP

1. Cowling for dents or cracks.
2. Dzus fasteners for condition.

3. Engine for dirt, oil leaks, and unsatisfactory protective coating.

4. Engine mounts for cracks, bends, and broken members; vibration isolators for looseness and serviceability.

5. Spark plugs, terminals, and shielding for serviceability and security.

6. Ignition cables for fraying or chafing.

7. Baffles for condition and security.

8. Intake manifolds for defective gaskets and mounting studs for security.

9. Carburetor heater, air scoop, and cabin heater for damage and security.

10. Exhaust manifold for broken studs, loose nuts, leakage, and cracks.

11. Starter, generator, and magnetos for broken or loose terminals, mounting bolts, and safetying.

12. Carburetor air filter for cleanliness and conditions.

13. Carburetor, pump, lines, connections, and primer for leaks.

14. Carburetor for security and safetying.

15. Oil lines for kinks, damages, leaks, security, and coding.

16. Oil cooler for dirt and drain plug for safetying.

17. Fuel and oil drain cocks and plugs for leaks and safetying.

18. Engine control linkage for excessive play, cracks, failure to hit stops, and security.

19. Carburetor for mixture and idle speed.

20. Miscellaneous.

## Section II. PROPELLER GROUP

21. Prop blades for nicks or damages to the extent that repairs are required, failure to move freely from high to low pitch, or blade track exceeding tolerances.

22. Hub and shaft for dirt and lubrication.

23. Blade pitch angles for proper setting.

24. Control linkage for security and excessive wear.

25. Propeller static operational range for adjustment.

26. Seals for leaks and condition.

27. Feathering system for adjustment.

28. Miscellaneous.

## Section III. FUSELAGE GROUP

29. Fuselage center section structure for cracks and damage.

30. Fuselage longitudinal members for cracks and damage.

31. Fire wall for cracks, dirt, and corrosion.
32. Fuselage for loose or missing rivets, punctures, cracks, buckled or wrinkled skin.
33. Baggage and cargo compartment for dirt and tiedown rings or straps for condition.
34. Fuel tanks, auxiliary pumps, valves, lines, or connections for leaks.
35. Fuel lines for kinks, damage, security, and coding.
36. Hydraulic lines for kinks, damage, leaks, security, and coding.
37. Battery container and cover for security.
38. Battery for low electrolyte and capacity check date; cables for security, wear, and corrosion.
39. Markings and insignia for legibility.
40. Miscellaneous.

## Section IV. WING GROUP

41. Flap and aileron hinge bolts for looseness and safetying.
42. Aileron bellcranks and flap mechanism for loose pitot bolts.
43. Wing attaching bolts for looseness and excessive wear.
44. Wing attaching lugs for cracks and bolt holes for excessive wear.
45. Wings for loose or missing rivets, skin punctures, cracks, and buckled or wrinkled skin.
46. Wing struts for security.
47. Ailerons for loose or missing rivets, skin punctures, or cracks.
48. Hinge points for lubrication.
49. Hydraulic lines and servos for leaks, security, and coding.
50. Flaps for loose or missing rivets, skin punctures, or cracks.
51. Miscellaneous.

## Section V. EMPENNAGE GROUP

52. Rudder, elevator, and trim tab hinge points for security and safetying.
53. Rudder and elevator for loose or missing rivets, skin punctures, or cracks.
54. Vertical and horizontal stabilizers for looseness, missing rivets, skin punctures, or cracks.
55. Tail cone for loose or missing rivets or cracks.
56. Empennage bulk heads and circumferentials for cracks or damage.
57. Miscellaneous.

## Section VI. LANDING GEAR GROUP

58. Struts for inflation, dirt, or damage.
59. Landing gear for alignment.
60. Landing gear mechanism linkage for dirt, looseness, and operation.
61. Shimmy dampers for leaks and fluid level.
62. Hydraulic lines and actuating cylinders for leaks, kinks, and coding.
63. Wheels for cracks and damage.
64. Tires for wear, pressure, and slippage.
65. Brakes for adjustment.
66. Brake cylinders for leakage.
67. Static ground for condition.
68. Tail and nose landing gear for wear, distortion, castering, and operation.
69. Miscellaneous.

## Section VII. FLIGHT CONTROLS GROUP

70. Flight controls for freedom of operation, position, and security.
71. Control cables for fraying and tension and turnbuckles for safetying.
72. Fairleads, pulleys, and guides for wear, cracks, and alignment.
73. Aileron, elevator, and rudder for limits of travel.
74. Aileron, elevator, and rudder for cracks, dents, and adjustment of primary and secondary control stops.
75. Trim tab control for adjustment, freedom of operation, and lubrication.
76. Flaps for chafing, correlation, and travel limits.
77. Miscellaneous.

## Section VIII. CABIN COCKPIT GROUP

78. Instruments for loose, broken, or dirty glass, improper markings, and mounting.
79. Instruments for operation and readability.
80. Instrument lines and connections for looseness, wear, kinks, and security.
81. Instrument panel for mounting and shielding.
82. Instrument and mapreading lights for operation.
83. Fuel selector for binds and leaks.
84. Toggle switches for operation.

85. Landing, navigation, or position lights for operation.

86. Throttle quadrant controls for full range of travel and unrestricted movements; friction adjustment devices for operation.

87. Window, windshield, or canopy Plexiglas for cracks, crazing, or improper repairs.

88. Cockpit, cabin, and Plexiglas for cleanliness.

89. Door, canopy, and emergency exit for operation.

90. Safety belts and shoulder harnesses for condition and inspection dates.

91. Seats for condition and operation.

92. Hydraulic hand pumps and lines for leakage.

93. First aid kit for broken seal and overdue inspection.

94. Portable fire extinguisher for mounting and inspection.

95. Upholstery for condition.

96. Map cases for condition.

97. Miscellaneous.

### Section IX. RADIO GROUP

98. Radio equipment for damage and security.

99. Antenna for damage, security, and cracked or broken insulators.

100. Bonding or shielding for fraying and security.

101. Spare fuse holder for specified number of serviceable fuses.

102. Interphone system for operation.

103. Miscellaneous.

## V. AIRCRAFT MAINTENANCE RECORDS TECHNICAL INSPECTION GUIDE

### Section I. DD FORM 781–2

1. Has time been properly transferred from DD Form 781–1?

2. Are the general information headings accurate?

3. Are the next scheduled inspections accurately shown?

4. In checking successive –2's for the same aircraft, is the last status symbol for one day always the first symbol for the following day?

5. Is the true status of the aircraft reflected in the "status today" column?

6. Are pilots correctly signing the "exceptional release"?

7. Has the proper entry been made in "Hours at Last IROAN"?

8. Is next scheduled oil change based on engine time?

9. Are gas and oil servicing entries correct?

10. Is total time on aircraft and engine properly transferred from –2 for the previous day?

11. Are uncorrected discrepancies correctly transferred to the –3 or the new –2?

12. Are pilots correctly signing off flights?

13. Are mechanics correctly signing off corrected discrepancies?

14. Are test flight entries correctly entered?

15. Are –2's turned in to the maintenance office as required?

16. Is the date of the last postflight inspection correctly entered?

17. Are serial numbers of items shown as required?

18. Are the initials of the line chief or records clerk shown in the lower right-hand corner as required?

19. Other?

## Section II. DD FORM 781–3

20. Are there any red dash entries other than accessories overdue replacements?

21. Is the discrepancy preceded by the date it was discovered?

22. Were entries approved by a responsible maintenance supervisor?

23. Is the date the entry was transferred from the –2 correctly shown?

24. Is correct procedure followed in transferring entries back to –2?

25. Is the correct procedure followed in initiating a new –3?

26. Are the requisition numbers for items not in stock shown as required?

27. Other?

## Section III. DD FORM 781–4

28. Is the aircraft general information correct?

29. Are all required items listed under the calendar inspection schedule?

30. Are completed inspections backed by a remark in the –2?

31. When a required inspection is completed, is the "next due date" properly entered?

32. Other?

## Section IV. DD FORM 781–5

33. Are all required items listed?

34. Are excess items listed?

35. Do serial numbers agree with those on DD Form 829?

36. Do replacement and removal entries agree with those on the DD Form 829?

37. Are replacement and removal entries backed up by a remark on the appropriate –2?

38. Are proper entries made for items which have had previous time?

39. Are separate –5's prepared for aircraft and engine-mounted accessories?

40. Other?

## Section V. DD FORM 781–6

41. Is the aircraft general heading information correct?

42. Is the aircraft time entered each day, and does it check with the –2 for that day?

43. Are the total hours of the aircraft since manufacture shown?

44. Is the number of landings by type entered each day, and do they check with the –1 for that day?

45. Are all entries verified by signature as required?

46. Are inspection records signatures entered as required?

47. Other?

## Section VI. DD FORM 829

48. Are DD Forms 829 initiated and maintained for all applicable components?

49. Does the acceptance date of aircraft agree with that shown on the DD Form 780?

50. For the basic aircraft, are total aircraft hours since manufacture reflected in the "Hours or Rounds Fired Total" column?

51. In the "Record of Transfers" section, is the time and date received the same as when aircraft or components were shipped?

52. Do the "R" and "S" appear in "Record of Transfer" column?

53. In the "Record of Associate Equipment" section, are the accessories listed those actually on the aircraft?

54. Are all required accessories listed, and are installations and removal entries correct? Are they backed up by entries in the appropriate –2?

55. Are only the basic engine accessories (carburetors and magnetos) listed?

56. Do the serial numbers of the accessories listed agree with those actually installed on the aircraft?

57. Are engine overhaul entries correct, and do they agree with the entries in the "Record of Transfers" section?

58. On helicopter gear box 829's, are required entries in the "Record of Associate Equipment" section?

59. Do the serial numbers agree with the serial number of the item installed on the aircraft or components?

60. Are overhaul entries correct?

61. When new forms are prepared, are proper entries made in accordance with the appropriate technical manual?

62. Other?

## Section VII. DD FORM 829–1

63. Is the general heading information correct?

64. Are DD Forms 829–1 initiated and maintained for all applicable items?

65. Are required Technical Manual compliances correctly entered?

66. Are proper entries carried on DD Form –2 or –3 for those Technical Manual compliances entered but not completed?

67. Are all Technical Manual entries double spaced?

68. Other?

## Section VIII. DD FORM 829–2

69. Is the general information correct?

70. Is DD Form 829–2 used only as continuation sheet for entries required in "Block 8" of basic DD Form 829?

71. Other?

## Section IX. DD FORM 780 Series

72. Are all entries made by typewriter or written in ink and double spaced?

73. Is the equipment list accurate, and have required deletions been made?

74. Are all unauthorized shortages entered and appropriate action initiated?

75. Are inventory checks being made every 6 months and properly recorded on DD Form –2?

76. Is all special equipment properly listed?

77. Are items which have been permanently removed properly accounted for?

78. Other?

# VI. TECHNICAL SUPPLY INSPECTION GUIDE

## Section I. SUPPLY PROCEDURE (GENERAL)

1. Are supply facilities adequate?
2. Are supplies properly stored, identified, and safeguarded?
3. Are excess supplies on hand?
4. Are TOE and memorandum receipt items handled through tech supply?
5. Are supply files neatly arranged?
6. Are unserviceable, recoverable items allowed to accumulate in the maintenance area?
7. Are serviceable items, except common hardware and emergency items in the aircraft, kept in the supply room until needed?
8. Is close supervision exercised over the issue and receipt of parts?
9. Are accessory replacement items for a particular aircraft marked and held for that aircraft until needed?
10. Are flammable items kept in a separate building?
11. Other?

## Section II. REQUISITION PROCEDURE

12. Is the DA Form 1546 properly prepared showing correct stock number and nomenclature, authorized amount, on hand and due in, basis, authority, type of requisition, property class, and tech service?
13. Are requisitions submitted when required?
14. Is correct procedure used to upgrade or downgrade requisitions?
15. Is correct lateral supply procedure used?
16. Are EDP requisitions for gradual wear items backed up by a special requisition?
17. Other?

## Section III. TURN-IN PROCEDURE

18. Is the DA Form 1546 properly prepared showing correct stock number and nomenclature?
19. Are unserviceable, recoverable items thoroughly cleaned, properly tagged, and promptly turned in to the appropriate tech service?
20. Are unserviceable tags properly filled out showing reason and previous operating time?
21. Are UR exhibits properly tagged?

22. Is only one property class entered on a turn-in slip?
23. Other?

## Section IV. STOCK LEVELS

24. Are stock levels based on usage factor?
25. Are letters of authorization on file to back up changes in stock level?
26. Are stock level adjustments made when usage varies because of weather or special operation?
27. Are requests for items which are normally field maintenance responsibility backed up by a letter of authorization from the responsible field maintenance officer?
28. Other?

## Section V. DAILY RECAPITULATION SHEET

29. Is each sheet used properly and identified by date and identification number?
30. If one sheet is used for several days, is each day's issue clearly indicated?
31. Is every item issued to mechanics properly recorded?
32. Are entries neat and legible?
33. Are complete stock number and nomenclature used?
34. Is the "recoverable items" column properly used?
35. Is action taken to insure prompt turn-in of unserviceable, recoverable items?
36. Are recapitulation sheets properly filed as required?
37. Other?

## Section VI. PARTS REQUEST SLIPS

38. Is required information shown?
39. Are slips neat and legible?
40. Is the duplicate returned to the mechanic or records clerk with suspense number entered?
41. Other?

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*NG:* State AG (3); units—same as Active Army except allowance is one copy to each unit.

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For explanation of abbreviations used, see AR 320–50.

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